

NPDES WORKSHOP

An Overview of the NPDES Program

List of Acronyms

Acronym	Full Phrase
ACR	Acute-to-Chronic Ratio
ANPRM	Advanced Notice of Proposed Rulemaking
ASR	Alternative State Requirement
ASTM	American Society for Testing and Materials
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BOD ₅	5-day BOD
BPJ	Best Professional Judgment
BPT	Best Practicable Control Technology Currently Available
CBOD	Carbonaceous BOD
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
CERI	Center for Environmental Research Information
CFR	Code of Federal Regulations
ChV	Chronic Value
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
DWO	Dry Weather Overflow
EIS	Environmental Impact Statement
ELG	Effluent Limitations Guidelines
EMMI	Environmental Monitoring Methods Index
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FDF	Fundamentally Different Factor
FR	Federal Register
FWS	Fish and Wildlife Service
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscopy
gpd	Gallons per Day
IC	Inhibition Concentration
I/I	Infiltration/Inflow
LA	Load Allocation
LC	Lethal Concentration
LC ₅₀	Concentration at which 50% of test organisms die in a specified time period

List of Acronyms

LD ₅₀	Dose at which 50% of test organisms die in a specific time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
LTCP	Long Term Control Plan
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MEP	Maximum Extent Practicable
mg/l	Milligram per Liter
mgd	Million Gallons per Day
MPN	Most Probable Number
MS4	Municipal Separate Storm Sewer System
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMC	Nine Minimum Controls
NMFS	National Marine Fisheries Service
NOEC	No Observable Effect Concentration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NTIS	National Technical Information Service
O&M	Operations and Maintenance
PCS	Permit Compliance System
PL	Public Law
POTW	Publicly Owned Treatment Works
PPETS	Pretreatment Permits and Enforcement Tracking System
PPIC	Pollution Prevention Information Clearinghouse
PQL	Practical Quantification Limit
PSD	Prevention Significant Deterioration
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QA	Quality Assurance
QC	Quality Control
QNCR	Quarterly Noncompliance Report
RAPP	Refuse Act Permit Program
R&D	Research and Development
RARA	Resource Conservation and Recovery Act
RBC	Reportable Noncompliance
SIC	Standard Industrial Classification
SIP	State Implementation Plan
S.C.	Significant Noncompliance
SPCC	Spill Presentation Control and Countermeasure Plan
SS	Suspended Solids
SO	Sanitary Sewer Overflow

List of Acronyms

STORED	EPA Storage and Retrieval Database
TCL	Toxicity Characteristic Leaching Procedure
TIE	Toxicity Identification Evaluation
TEN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TMDL	Total Maximum Daily Load
TRC	Technical Review Criteria
TRE	Toxicity Reduction Evaluation
TRI	Toxic Release Inventory
TS	Total Solids
TSCA	Toxic Substances Control Act
TSD	Technical Support Document
TSDF	Treatment, Storage, and Disposal Facility
TSS	Total Suspended Solids
TTO	Total Toxic Organics
TUa	acute Toxic Units
TUc	chronic Toxic Units
TVS	Total Volatile Solids
TWTDS	Treatment Works Treating Domestic Sewage
USC	United States Code
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WET	Whole Effluent Toxicity
WLA	Waste Load Allocation
WQA	Water Quality Act of 1987
WQBEL	Water Quality-Based Effluent Limit(s)
WQS	Water Quality Standards(s)

Glossary of Terms

This glossary includes a collection of the terms used in this manual and an explanation of each term. To the extent that **definitions and explanations provided in this glossary differ from those in EPA regulations or other official documents**, they are intended for use in understanding this manual only.

- **401(a)** Certification-A requirement of Section 401(a) of the Clean Water Act that all federally issued permits be certified by the State in which the discharge occurs. The State certifies that the proposed permit will comply with State water quality standards and other State Requirements.
- **Acute**-A stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.
- **Anti-backsliding**-A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); CFR §122.44(1)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.
- **Antidegradation**-Policies which ensure protection of water quality for a particular water body where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation plans are adopted by each State to minimize adverse effects on water.
- **Authorized Program or Authorized State**-A State, Territorial, Tribal, or interstate NPDES program which has been approved or authorized by EPA under 40 CFR Part 123.
- **Average Monthly Discharge Limitations**-The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during that month divided by the number of days on which monitoring was performed (except in the case of fecal coliform).
- **Average Weekly Discharge Limitation**-The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

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- **Best Available Technology Economically Achievable (BAT)**-Technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.
- **Best Conventional Pollutant Control Technology (BCT)**-Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part “cost reasonableness” test which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.
- **Best Management Practice (BMP)**-Permit condition used in place of or in conjunction with effluent limitations to prevent or control the discharge of pollutants. May include schedule of activities, prohibition of practices, maintenance procedure, or other management practice. BMPs may include, but are not limited to, treatment requirements, operating procedures, or practices to control plant site runoff, spillage, leaks, sludge or waste disposal, or drainage from raw material storage.
- **Best Practicable Control Technology Currently Available (BPT)**-The first level of technology-based standards established by the CWA to control pollutants discharged to waters of the U.S. BPT effluent limitations guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory.
- **Best Professional Judgment (BPJ)**-The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.
- **Bioassay**-A test used to evaluate the relative potency of a chemical or a mixture of a standard preparation on the same type of organism.
- **Biochemical Oxygen Demand (BOD)**-A measurement of the amount of oxygen utilized by the decomposition of organic material, over a specified time period (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.

Glossary of Terms

- **Bypass**-The intentional diversion of wastestreams from any portion of a treatment (or pretreatment) facility.
- **Categorical Industrial User (CIU)**-An industrial user subject to National categorical pretreatment standards.
- **Categorical Pretreatment Standards**-Limitations on pollutant discharges to publicly owned treatment works promulgated by EPA in accordance with Section 307 of the Clean Water Act that apply to specified process wastewaters of particular industrial categories [40 CFR §403.6 and Parts 405-471] .
- **Chemical Oxygen Demand (COD)**-A measure of the oxygen-consuming capacity of inorganic and organic matter present in wastewater. COD is expressed as the amount of oxygen consumed in mg/l. Results do not necessarily correlate to the biochemical oxygen demand (BOD) because the chemical oxidant may react with substances that bacteria do not stabilize.
- **Chronic**-A stimulus that lingers or continues for a relatively long period time, often one-tenth of the life span or more. Chronic should be considered a relative term depending on the life span of an organism. The measurement of a chronic effect can be reduced growth, reduced reproduction, etc., in addition to lethality.
- **Clean Water Act (CWA)**-The Clean Water Act is an act passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 or Federal Water Pollution Control Act Amendments of the 1972 (Public Law 92-500), 33 U.S.C. 1251 et.seq., as amended by: Public Law 97-117, Public Laws 95-217, 97-117, 97-440, and 100-04.
- **Code of Federal Regulations (CFR)**-A codification of the final rules published daily in the Federal Register. Title 40 of the CFR contains the environmental regulations.
- **Combined Sewer Overflow (CSO)**-A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters.
- **Combined Sewer System (CSS)**-A wastewater collection system which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single pipe to a publicly owned treatment works for treatment prior to discharge to surface waters.

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- **Compliance Schedule**-A schedule of remedial measures included in a permit or an enforcement order, including a sequence of interim requirements (for example, actions, operations, or milestone events) that lead to compliance with the CWA and regulations.
- **Composite Sample**-Sample composed of two or more discrete samples. The aggregate sample will reflect the average water quality covering the compositing or sample period.
- **Conventional Pollutants**-Pollutants typical of municipal sewage, and for which municipal secondary treatment plants are typically designed; defined by Federal Regulation [40 CFR §401.16] as BOD, TSS, fecal coliform bacteria oil and grease, and pH.
- **Criteria**-The numeric values and the narrative standards that represent contaminant concentrations that are not be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.
- **Daily Discharge**-The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR §122.2).
- **Daily Maximum Limit**-The maximum allowable discharge of pollutant during a calendar day. Where daily maximum limitations are expressed in units of mass, the daily discharge is the total mass discharged over the course of the day. Where daily maximum limitations are expressed in terms of a concentration, the daily discharge is the arithmetic average measurement of the pollutant concentration derived from all measurements taken that day.
- **Development Document**-A report prepared during the development of an effluent limitation guideline by EPA that provides the data and methodology used to develop limitations guidelines and categorical pretreatment standards for an industrial category.

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- **Director**-The Regional Administrator or State Director, as the context requires, or an authorized representative. When there is no approved State program, and there is an EPA administered program, Director means the Regional Administrator. When there is an approved State program, “Director” normally means the State Director.
- **Discharge Monitoring Report (DMR)**-The form used (including any subsequent additions, revisions, or modifications) to report self-monitoring results by NPDES permittees. DMRs must be used by approved States as well as by EPA.
- **Draft Permit**-A document prepared under 40 CFR §124.6 indicating the Director’s tentative decision to issue, deny, modify, revoke and reissue, terminate, or reissue a permit. A notice of intent to terminate a permit, and a notice of intent to deny a permit application, as discussed in 40 CFR §124.5, are considered draft permits. A denial of a request for modification, revocation and reissuance, or terminations, as discussed in 40 CFR §124.5, is not a draft permit.
- **Effluent Limitation**-Any restriction imposed by the Director on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.
- **Effluent Limitations Guidelines (ELG)**-A regulation published by the Administrator under Section 304(b) of CWA that establishes national technology-based effluent requirements for a specific industrial category.
- **Fact Sheet**-A document that must be prepared for all draft individual permits for NPDES major discharges, NPDES general permits, NPDES permits that contain variances, NPDES permits that contain sewage sludge land application plans and several other classes of permittees. The document summarizes the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit and tells how the public may comment (40 CFR §124.8 and §124.56). Where a fact sheet is not required, a statement of basis must be prepared (40 CFR §124.7).
- **Fundamentally Different Factors (FDF)**-Those components of a petitioner’s facility that are determined to be so unlike those components considered by EPA during the effluent limitation guideline and pretreatment standards rulemaking that the facility is worthy of a variance from the effluent limitations guidelines or categorical pretreatment standards.

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- **General Permit**-An NPDES permit issued under 40 CFR §122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharge.
- **Grab Sample**-A sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.
- **Hazardous Substance**-Any substance, other than oil, which, when discharged in any quantities into waters of the U.S., presents an imminent and substantial danger to the public health or welfare, including but not limited to fish, shellfish, wildlife, shorelines and beaches (Section 311 of the CWA); identified by EPA as the pollutants listed under 40 CFR Part 116.
- **Indirect Discharge**-The introduction of pollutants into a municipal sewage treatment system from any nondomestic source (i.e., any industrial or commercial facility) regulated under Section 307(b), (c), or (d) of the CWA.
- **Instantaneous Maximum Limit**-The maximum allowable concentration of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.
- **Local Limits**-Conditional discharge limits imposed by municipalities upon industrial or commercial facilities that discharge to the municipal sewage treatment system.
- **Major Facility**-Any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved State programs, the Regional Administrator in conjunction with the State Director. Major municipal dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA/State approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA/State.
- **Mass-Based Standard**-A discharge limit that is measured in a mass unit such as pounds per day.
- **Method Detection Limit (MDL)**-Defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

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- **Million Gallons per Day (mgd)**-A unit of flow commonly used for wastewater discharges. One mgd is equivalent to 1.547 cubic feet per second.
- **Mixing Zone**-An area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.
- **Municipal Separate Storm Sewer System (MS4)**-A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) owned by a State, city, town or other public body, that is designed or used for collecting or conveying storm water, which is not a combined sewer, and which is not part of a publicly owned treatment works. Commonly referred to as an "MS4" [40 CFR §122.26(b)(8)].
- **National Pollutant Discharge Elimination System (NPDES)**-The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of CWA.
- **National Pretreatment Standard or Pretreatment Standard**-Any regulation promulgated by the EPA in accordance with Sections 307(b) and (c) of the CWA that applies to a specific category of industrial users and provides limitations on the introduction of pollutants into publicly owned treatment works. This term includes the prohibited discharge standards under 40 CFR §403.5, including local limits [40 CFR §403.3(j)].
- **New Discharger**-Any building, structure, facility, or installation:
 - a.. From which there is or may be a discharge of pollutants.
 - b. That did not commence the discharge of pollutants at that particular site prior to August 13, 1979;
 - c. Which is not a new source; and
 - d. Which has never received a finally effective NPDES permit for discharges at that site.

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- **New Source**-Any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:
 - a. After promulgation of standards of performance under Section 306 of the CWA which are applicable to such source; or
 - b. After proposal of standards of performance in accordance with Section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 of the CWA within 120 days of their proposal.
 - c. Except as otherwise provided in an applicable new source performance standard, a source is a new source if it meets the definition in 40 CFR §122.2; and
 - i. It is constructed at a site at which no other source is located; or
 - ii. It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or
 - iii. Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.
- **New Source Performance Standards (NSPS)**-Technology-based standards for facilities that qualify as new sources under 40 CFR §122.2 and 40 CFR §122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.
- **Nonconventional Pollutants**-All pollutants that are not included in the list of conventional or toxic pollutants in 40 CFR Part 401. Includes pollutants such as chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, and phosphorus.
- **pH**-A measure of the hydrogen ion concentration of water or wastewater; expressed as the negative log of the hydrogen ion concentration mg/l. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.

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- **Point Source**-Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.
- **Pollutant**-Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.
- **Pollutant, Conservative**-Pollutants that do not readily degrade in the environment, and which are mitigated primarily by natural stream dilution after entering receiving bodies of waters. Included are pollutants such as metals.
- **Pollutant, Non-Conservative**-Pollutants that are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving stream after in-stream mixing and dilution have occurred.
- **Practical Quantification Limit (PQL)**-The lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
- **Pretreatment**-The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a publicly owned treatment works[40 CFR §403.3(q)].
- **Primary Industry Categories**-Any industry category listed in the Natural Resources Defense Council (NRDC) settlement agreement [NRDC et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12. E.R.C. 1833 (D.D.C, 1979)] for which EPA has or will develop effluent guidelines; also listed in Appendix A of 40 CFR Part 122.
- **Primary Treatment**-The practice of removing some portion of the suspended solids and organic matter in a wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).

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- **Priority Pollutants**-Those pollutants considered to be of principal importance for control under the CWA based on the NRDC consent decree settlement [NRDC et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976) modified 12 E.R.C. 1833 (D.D.C. 1979)]; a list of these pollutants is provided as Appendix A to 40 CFR Part 423.
- **Process Wastewater**-Any water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.
- **Production-Based Standard**-A discharge standard expressed in terms of pollutant mass allowed in a discharge per unit of product manufactured.
- **Proposed Permit**-A State NPDES permit prepared after the close of the public comment period (and when applicable, any public hearing and administrative appeals) which is sent to EPA for review before final issuance by the State).
- **Publicly Owned Treatment Works (POTW)**-A treatment works, as defined by Section 212 of the CWA, that is owned by the State or municipality. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant [40 CFR §403.3].
- **Sanitary Sewer**-A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.
- **Sanitary Sewer Overflows (SO)**-Untreated or partially treated sewage overflows from a sanitary sewer collection system.
- **Secondary Industry Category**-Any industry category which is not a primary industry category.
- **Secondary Treatment**-Technology-based requirements for direct discharging municipal sewage facilities. Standard is based on a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: BOD₅, suspended solids (SS), and pH (except as provided for special considerations and treatment equivalent to secondary treatment).
- **Self-Monitoring**-Sampling and analyses performed by a facility to determine compliance with a permit or other regulatory requirements.

Glossary of Terms

- **Spill Prevention Control and Countermeasure Plan (SPCC)**-A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities should a spill occur.
- **Significant Industrial User (SIU)**-An indirect discharger that is the focus of control efforts under the national pretreatment program; includes all indirect dischargers subject to national categorical pretreatment standards, and all other indirect dischargers that contribute 25, 000 gpd or more of process wastewater, or which make up five percent or more of the hydraulic or organic loading to the municipal treatment plant, subject to certain exceptions [40 CFR §403.3(t)].
- **Standard Industrial Classification (SIC) Code**-A code number system used to identify various types of industries. The code numbers are published by the superintendent of documents, U.S. Government Printing Office, Washington, D.C. 20402. A particular industry may have more than one SIC code if it conducts several types of commercial or manufacturing activities onsite.
- **Statement of Basis**-A document prepared for every draft NPDES permit for which a fact sheet is not required. A statement of basis briefly describes how permit conditions were derived and the reasons the conditions are necessary for the permit [40 CFR §124.7].
- **STORED**-EPA's computerized STOrage and REtrieval water quality data base that includes physical, chemical, and biological data measured in waterbodies throughout the United States.
- **Storm Water**-Storm Water runoff, snow melt runoff, and surface runoff and drainage [40 CFR §122.26(b)(13)].
- **Technology-Based Effluent Limit**-A permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration.
- **Tiered Permit Limits**-Permit limits that only apply to the discharge when a certain threshold (e.g., production level), specific circumstance (e.g., batch discharge), or timeframe (e.g., after 6 months) triggers their use.
- **Tiered Testing**-Any of a series of tests that are conducted as a result of a previous test's findings.

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- **Total Maximum Daily Load (TMDL)**-The amount of pollutant, or property of a pollutant, from point, nonpoint, and natural background sources, that may be discharged to a water quality-limited receiving water. Any pollutant loading above the TMDL results in violation of applicable water quality standards.
- **Total Organic Carbon (TOC)**-Measures the amount of organic carbon in water.
- **Total Suspended Solids (TSS)**-A measure of the filterable solids present in a sample, as determined by the method specified in 40 CFR Part 136.
- **Toxic Pollutant**-Pollutants or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring. Toxic pollutants also include those pollutants listed by the Administrator under CWA Section 307(a)(1) or any pollutant listed under Section 405(d) which relates to sludge management.
- **Toxicity Reduction Evaluation (TRE)**-A site-specific study conducted in a stepwise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources to toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.
- **Toxicity Test**-A procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.
- **Treatability Manual**-Five-set library of EPA guidance manuals that contain information related to the treatability of many pollutants. This manual can be used in developing NPDES permit limitations for facilities and/or pollutants which, at the time of permit issuance, are not subject to industry-specific effluent guidelines. The five volumes that comprise this series include: Vol. I - Treatability Data (EPA-600/8-80/042a); Vol. II - Industrial Descriptions (EPA-600/8-80-042b); Vol. III - Technologies (EPA-600/8-80-042c); Vol. IV - Cost Estimating (EPA-600/8-80-042d); Vol. V - Summary (EPA-600/8-80-042e).
- **TSD**-Abbreviation for the Technical support Document Water Quality-based Toxics Control (EPA-505/2-90-001), EPA Office of Water Enforcement and Permits, 1991. It contains procedures for water quality-based limitation development.

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- **TWTDS**-Abbreviation for Treatment Works Treating Domestic Sewage. Includes all POTWs and other facilities that treat domestic wastewater, and facilities that do not treat domestic wastewater, but that treat or dispose of sewage sludge.
- **Upset**-An exceptional incident in which there is unintentional and temporary noncompliance with the permit limit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- **Variance**-Any mechanism or provision under Sections 301 or 316 of the CWA or under 40 CFR Part 125, or in the applicable “effluent limitations guidelines” which allows modification to or waiver of the generally applicable effluent limitations requirements or time deadlines of the CWA. This includes provisions which allow the establishment of alternative limitations based on fundamentally different factors.
- **Wastesload Allocation (WLA)**-The proportion of a receiving water’s total maximum daily load that is allocated to one of its existing or future point sources of pollution.
- **Water Quality-Based Effluent Limit (WQBEL)**-A value determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, and wildlife) for a specific point source to a specific receiving water for a given pollutant.
- **Water Quality Criteria**-Comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.
- **Water Quality Standard (WQS)**-A law or regulation that consists of the beneficial use or uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular waterbody, and an antidegradation statement.

Glossary of Terms

- **Waters of the United States**-All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States include but are not limited to all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds. [See 40 CFR §122.2 for the complete definition].
- **Whole Effluent Toxicity (WET)**-The total toxic effect of an effluent measured directly with a toxicity test.

Objectives of Workshop



- Overview of statutes & regulations
- Permit process
- Types of effluent limits
- Other permit conditions
- Other permitting considerations
- Administrative process
- Compliance & enforcement

- Provide an overview of the scope and regulatory framework of the NPDES Program
- Describe the components of a permit and provide an overview of the permitting process
- Describe the different types of effluent limits and the legal and technical considerations involved in limit development
- Describe other permit conditions including:
 - special conditions
 - standard conditions
 - monitoring and reporting requirements
- Describe other permitting considerations including:
 - variances
 - anti-backsliding
 - other statutes (NEPA, ESA, NHPA, etc.)
- Explain the administrative process for issuing, modifying, revoking and terminating NPDES permits

Overview of Statutes & Regulations

- ◆ Statutory evolution
- ◆ Current NPDES program direction
- ◆ Scope of NPDES program
- ◆ CWA classes of pollutants
- ◆ Regulatory framework
- ◆ Federal NPDES regulations

Organization of the Clean Water Act

Title I Research and Related Programs

Title II Grants for Construction of Treatment Works

Title III Standards and Enforcement

- Section 301 Effluent Limitations
- Section 302 Water Quality-Related Effluent Limitations
- Section 303 Water Quality Standards and Implementation Plans
- Section 304 Information and Guidelines [Effluent]
- Section 305 Water Quality Inventory
- Section 307 Toxic and Pretreatment Effluent Standards

Title IV Permits and Licenses

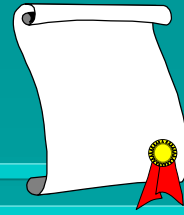
- Section 402 National Pollutant Discharge Elimination System (NPDES)
- Section 405 Disposal of Sewage Sludge

Title V General Provisions

- Section 502 Definitions
- Section 510 State Authority
- Section 518 Indian Tribes

Title VI State Water Pollution Control Revolving Funds

Statutory Evolution



- ↓ 1800's - 1970: Legislative Initiatives
- ↓ 1972: Federal Water Pollution Control Act Amendments (Clean Water Act)
- ↓ 1972-1976: First NPDES permits issued for conventional pollutants
- ↓ 1977: Clean Water Act Amendments
- ↓ 1987: Water Quality Act

•The NPDES program evolved from several legislative initiatives issued prior to 1972.

Federal Water Pollution Control Act Amendments (Clean Water Act)

- ◆ NPDES, state, pretreatment, and construction grants programs
- ◆ Established compliance dates
- ◆ Permit compliance is shield
- ◆ Penalties for permit violations

- Nov. 1972, Congress passed Federal Water Pollution Control Act Amendments which included the NPDES permit program as the means to control national water pollution.

- The goal of this Act was to eliminate the discharge of pollutants into navigable waters by 1985 - this goal was not realized, but remains a principle for establishing permit requirements.

- An interim goal of the Act was to achieve “water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water” by July 1, 1983. More commonly known as the “fishable, swimmable” goal.

- Important principles of Act:

- Permits are a privilege - not a right
- A discharge permit is required - max. duration 5 years
- Effluent limits must be both technology- and water quality-based

Clean Water Act Amendments

- ◆ NRDC Consent Decree
- ◆ Federal facilities subject to state programs
- ◆ Pretreatment program delegation

•In 1976, the Natural Resources Defense Council (NRDC) sued EPA over inadequate controls of toxic discharges. The consent decree identified:

- “priority” pollutants be controlled
- “primary industries” for technology-based control
- methods for regulating toxic discharges

•Pretreatment program delegation

- authorized EPA to approve local pretreatment programs
- required NPDES states to modify programs to include pretreatment oversight

Water Quality Act

- ◆ Stormwater permit requirements
- ◆ Indian tribes considered “States”
- ◆ Federal sludge management program
- ◆ Initiation of 303(d) list
- ◆ Anti-backsliding requirement

•Industrial storm water discharges must meet the equivalent BCT/BAT effluent quality. Discharges from municipal separate storm sewer systems (MS4) required controls to reduce the discharge of pollutants to the maximum extent practicable (MEP).

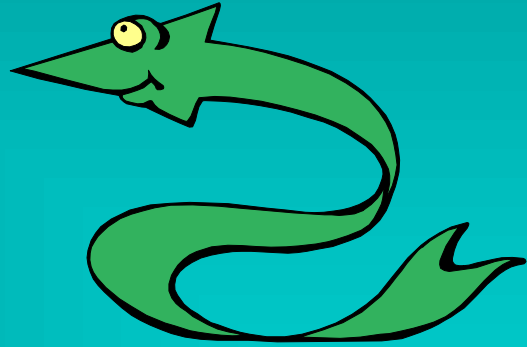
•EPA required to identify toxics in sewage sludge and establish numerical limits to control pollutants.

•All states required to identify waters that were not expected to meet water quality standards after technology-based controls on point sources have been imposed. States must prepare an individual control strategy to reduce toxics from point and nonpoint sources.

•Anti-backsliding requirement would not allow an existing permit to be modified or reissued with less stringent effluent limitations, standards, or conditions than those already imposed. There were a few exceptions for technology-based limits, but in no case could the limits be less stringent than the effluent guidelines (unless a variance has been granted) or violate water quality standards.

Current NPDES Program Direction

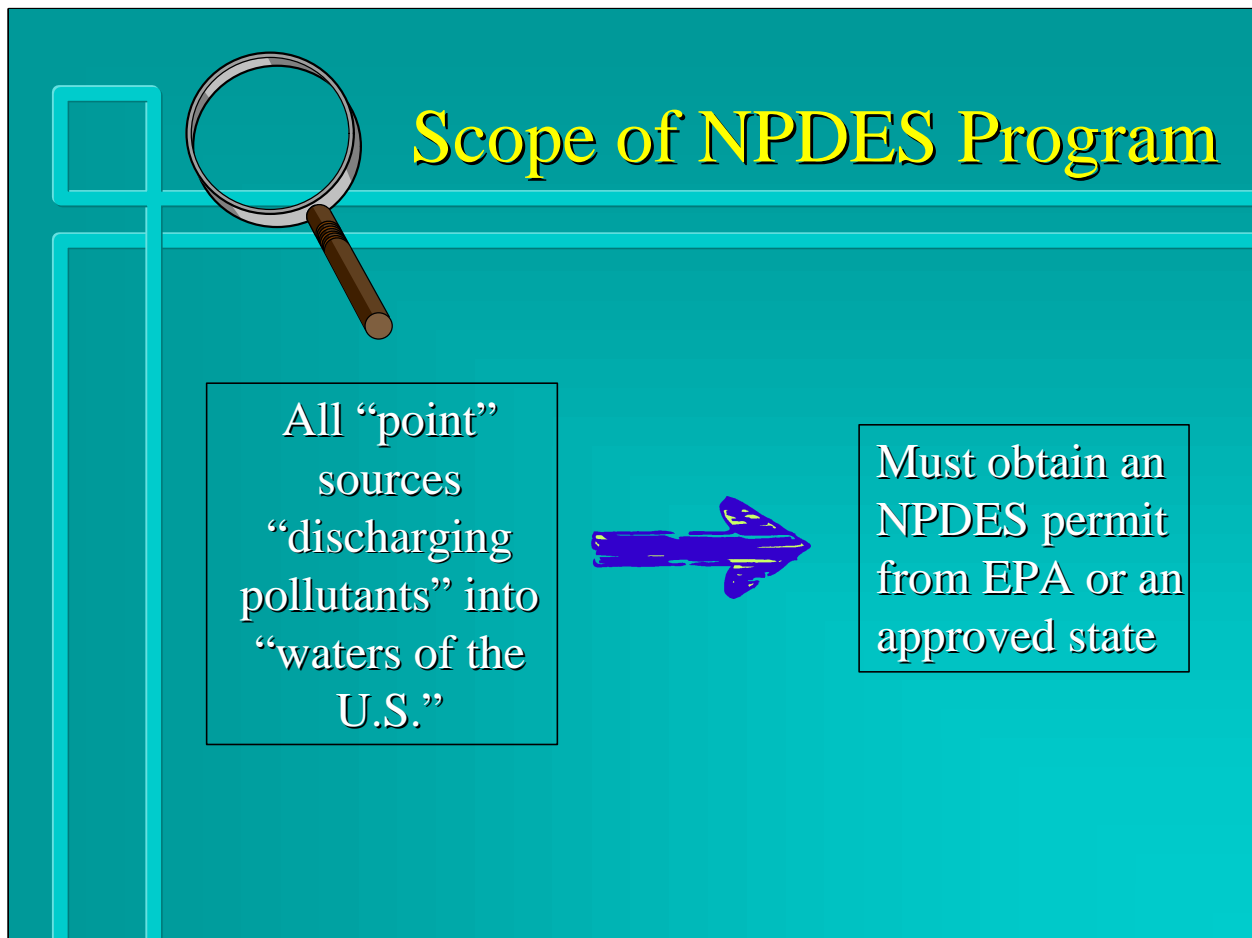
- ⇒ Ecosystem protection/Watershed strategy
- ⇒ Common sense initiative
- ⇒ Pollution Prevention
- ⇒ Wet weather discharge control



•EPA's new emphasis is to address all stressors within a hydrologically defined drainage basin instead of viewing individual pollutant sources in isolation of other stressors. This approach allows EPA to recognize that the health of our water resources are the result of complex interactions of various pollution sources, habitat conditions, flow and many other factors. EPA believes that these problems are best addressed through the development of watershed plans that integrate controls of point and nonpoint sources and provide decision-makers with an opportunity to consider issues such as protection and restoration of habitats, drinking water sources, groundwater protection and other environmental and social objectives. EPA strongly encourages innovative approaches that implement NPDES requirements in ways that achieve greater environmental results at the least cost.

•The common sense initiative includes industry-specific multimedia protection, stakeholder involvement, and burden reduction. EPA is committed to getting permittees and other interested parties involved at an early stage of the permit development and decision making process. This early involvement provides an opportunity for the permitting authorities, permittees and stakeholders to identify errors, address questions and develop optimal solutions. EPA is also pursuing regulatory reforms to eliminate unnecessary regulations and to reduce administrative burdens.

•EPA is actively engaged with states, environmental groups and the regulated community to address pollution problems from wet weather sources (CSOs, stormwater and sanitary sewer overflows), mining operations, CAFOs, and other key point sources involved in wet weather activities.



- For regulatory purposes, sources of pollutants are categorized as “point sources” or “nonpoint sources”. Typical point source discharges are those from POTWs, industrial facilities, and urban runoff. Nonpoint sources include the majority of agricultural activities and are exempt from NPDES regulations (exception is CAFOs). (See Glossary)
- Pollutants include any type of “waste” being discharged into water and are categorized into three types: Conventional, Toxic, and Nonconventional. (See next slide for details, See Glossary)
- Waters of the U.S. include
 - navigable waters
 - tributaries of navigable waters
 - intrastate lakes, rivers and streams
 - wetlands
 - Intermittent streams
 - See Glossary

CWA Classes of Pollutants

- ◆ Conventional
 - BOD, TSS, Oil & Grease, Fecal Coliform, pH
- ◆ Toxic
 - Heavy Metals, Organic Chemicals
- ◆ Nonconventional
 - Ammonia, Chlorine, Toxicity, COD, nitrogen, phosphorus, etc.

Federal NPDES Regulations (40 CFR Part 122)

Subpart A Definitions and General Program Requirements

- 122.1 Purpose and Scope of NPDES Program
- 122.2 Definitions
- 122.3 Exclusions
- 122.4 Prohibitions
- 122.5 Effect of a Permit
- 122.6 Continuation of Expired Permits
- 122.7 Confidentiality of Information

Subpart B Permit Application and Special NPDES Program Requirements

- 122.21 Applications
- 122.22 Signatures Requirements for Applications
- 122.23 Animal Feeding Operations
- 122.24 Aquatic Animal Production
- 122.25 Aquaculture
- 122.26 Storm Water Discharges
- 122.27 Silviculture
- 122.28 General Permits
- 122.29 New Sources and New Discharges

Subpart C Permit Conditions

- 122.41 Standard Conditions
- 122.42 Standard Conditions Applicable to specified Categories
- 122.43 Permit Conditions
- 122.44 Permit Limitations
 - (a) Technology Basis
 - (b) Other Basis (not WQ)
 - (c) Reopeners
 - (d) Water Quality Basis
 - (e) Priority Pollutants
 - (f) Notification Levels
 - (g) 24 Hour Reporting
 - (h) Duration of Permits
 - (i) Monitoring
 - (j) Pretreatment Program
 - (k) Best Management Practices
 - (l) Anti-Backsliding
 - (m) Private Treatment Works
 - (n) Grants
 - (o) Sludge
 - (p) Coast Guard
 - (p) Navigation
- 122.45 Calculating Limitations
 - (a) Discharge Points
 - (b) Production Basis
 - (c) Metals
 - (d) Continuous Discharges
 - (e) Non-continuous Discharges
 - (f) Mass Based Limits
 - (g) Intake Water Pollutants
 - (h) Internal Waste Streams
 - (i) Discharge into Wells
- 122.46 Duration of Permits
- 122.47 Schedules of Compliance
- 122.48 Reporting
- 122.49 Consideration of Other Federal Laws
- 122.50 Disposal to Other Points

Subpart D Transfer, Modification, Revocation and Reissuance, and Termination of Permit

- 122.61 Transfer of Permits
- 122.62 Modification or Revocation and Reissuance of Permits
- 122.63 Minor Modifications of Permits
- 122.64 Termination of Permits

NPDES Program Areas and Applicable Regulations

Source	Activity	Program Areas	Applicable Regulations
Municipal	Municipal Effluent Discharge	NPDES Point Source Control Program	40 CFR 122 40 CFR 125 40 CFR 133
	Indirect Industrial/Commercial Discharges	Pretreatment Program	40 CFR 122 40 CFR 403 40 CFR 405-499
	Municipal Sludge Use and Disposal	Municipal Sewage Sludge Program	40 CFR 122 40 CFR 257 40 CFR 501 40 CFR 503
	Combined Sewer Overflow (CSO) Discharges	CSO Control Program	40 CFR 122 40 CFR 125
	Storm Water Discharges (Municipal)	Storm Water Program	40 CFR 122 40 CFR 125
Industrial	Process Wastewater Discharges	NPDES Point Source Control Program	40 CFR 122 40 CFR 125 40 CFR 405-499
	Non-process Wastewater Discharges	NPDES Point Source Control Program	40 CFR 122 40 CFR 125
	Storm Water Discharges (Industrial)	Storm Water Program	40 CFR 122 40 CFR 125

Regulatory Framework

- ◆ Code of Federal Regulations (CFR)
 - final regulations
 - published annually
- ◆ Federal Register (FR)
 - proposed regulation
 - background information
 - published daily
- ◆ <http://www.gpo.gov>

•The CFR is a set of documents listing all regulations issued by every United States government agency. Even though Congress established the CWA, they required EPA to develop and implement the NPDES permit program. Therefore, EPA had to develop specific regulations to carry out the congressional mandate. The primary regulations developed by EPA to implement and administer the NPDES program are found in Title 40 of the CFR Part 122.

•The FR is the vehicle by which EPA and other branches of the Federal government provide notice of, propose, and promulgate regulations. Although the regulations can be found in the CFR, the background and implementation information related to these regulations can be found in the preamble to the regulations contained in the FR. This information is important to the permit writer because it explains the regulatory basis upon which permitting decisions are made.



Federal NPDES Regulations

<u>40 CFR Part</u>	<u>Description</u>
121	State Certification of Activities Requiring a Federal License or Permit
122	EPA Administered Permit Programs: The National Pollution Discharge Elimination System
123	State Program Requirements
124	Procedures for Decision making
125	Criteria and Standards for the National Pollutant Discharge Elimination System (technology-based standards)
129	Toxic Pollutant Effluent Standards
130	Water Quality Planning and Management
131	Water Quality Standards
133	Secondary Treatment Standards (POTWs)
135	Citizen Suits
136	Guidelines for Establishing Test Procedures for the Analysis of Pollutants
257	State Sludge Disposal Regulations
401	General Provisions
403	General Pretreatment Regulations
405-499	Effluent Limitations Guidelines and Standards
501	State Sludge Management Program Regulations
503	Standards for the Use or Disposal of Sewage Sludge

Objectives of Workshop



- ✓ Overview of statutes & regulations
 - Permit process
 - Types of effluent limits
 - Other permit conditions
 - Other permitting considerations
 - Administrative process
 - Compliance & enforcement

Permitting Process

- ◆ Types of Permits
- ◆ Major Permit Components
- ◆ Permit Process
 - Individual
 - General
- ◆ Roles and Responsibilities

What is a Permit?

- ◆ It is a license....
 - Issued by the government
 - Granting permission to discharge
- ◆ A permit is a privilege not a right

•An NPDES permit is a license for a facility to discharge a specified amount of a pollutant into a receiving water under certain conditions. It is issued by the government to persons conducting business in the U.S. The license grants the permission to do something which would be illegal in the absence of the permit.

•There is no right to a permit and it is revocable for cause (noncompliance).

Types of Permits

- ◆ Individual Permit
 - single applicant
 - one permit issued
- ◆ General Permit
 - discharge category identified
 - geographical area identified
 - one permit issued
 - several applicants

•An individual permit is issued to an single facility after the submittal of the appropriate application(s). The permit is specifically tailored to include limitations and requirements based on the type of activity, nature of discharge, receiving water quality, and facility history.

•A general permit is developed and issued by a permitting authority to cover multiple facilities within a specific category. A general permit cover several dischargers with the same or similar operations, or dischargers with the same wastes. However, general permits may only be issued within specific geographical areas. General permits offer a cost-effective option for agencies because of the large number of facilities that can be covered under a single permit, thus eliminating the time and money necessary to issue an individual permit to each facility. In addition, the use of a general permit ensures consistency of permit conditions for similar facilities.

Major Components of a Permit

- ❏ Cover Page
- ❏ Effluent Limitations
- ❏ Monitoring and Reporting Requirements
- ❏ Special Conditions
- ❏ Standard Conditions

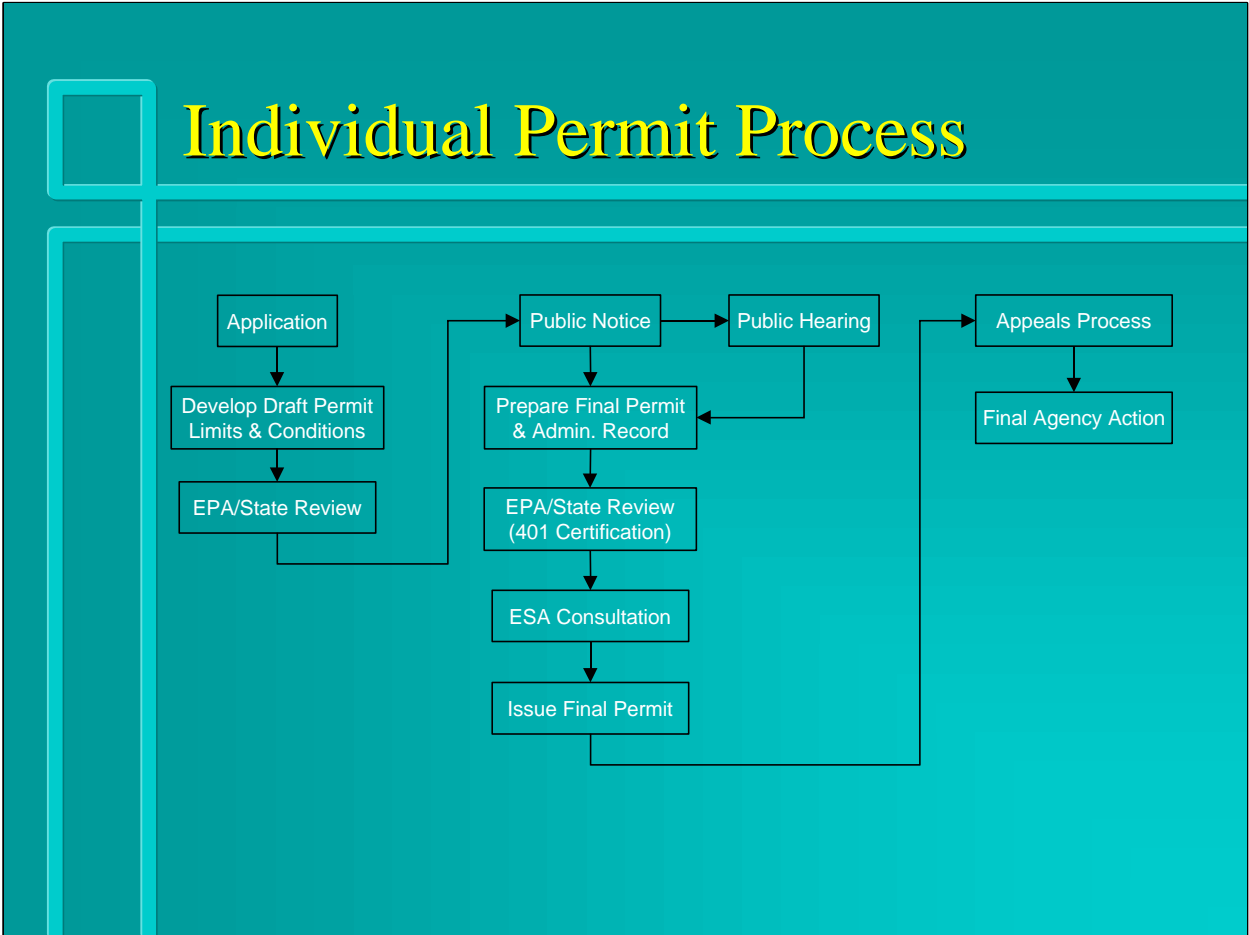
- Cover Page - typically contains the name and location of the permittee, a statement authorizing the discharge, and a listing of the specific locations for which a discharge is authorized.
 - Effluent Limitations - the primary mechanism for controlling discharges of pollutants to receiving waters. The majority of the permit writer's time is spent deriving appropriate effluent limitations based on applicable technology and water quality standards.
 - Monitoring and Reporting Requirements - used to characterize wastestreams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions.
 - Special Conditions - developed to supplement effluent limitations guidelines. Examples include BMPs, additional monitoring activities, ambient stream surveys, toxicity reduction evaluations, etc.
 - Standard Conditions - pre-established conditions that apply to all NPDES permits and that delineate the legal, administrative, and procedural requirements of the NPDES permit.
-
- The contents of some of these sections will vary depending on whether the permit is to be issued to a municipal or industrial facility, and whether the permit type is an individual or general permit.

Permit Components - Industrial

- ▣ Cover Page
- ▣ Effluent Limitations
 - **Technology-Based**
 - » Effluent Guidelines
 - » BPJ
 - Water Quality-Based
 - » Water Quality Standards
 - » TMDL
- ▣ Monitoring Requirements
- ▣ Special Conditions
 - Compliance Schedules
 - Stormwater
 - BMPs
 - Special Studies, Evaluations, Other Requirements
- ▣ Standard Conditions for Industrial Facilities

Permit Components - Municipal

- ☞ Cover Page
- ☞ Effluent Limitations
 - Technology-Based
 - » Secondary
 - » Equivalent to Secondary
 - Water Quality-Based
 - » Water Quality Standards
 - » TMDL
- ☞ Monitoring Requirements
- ☞ Special Conditions
 - Compliance Schedules
 - Stormwater
 - BMPs
 - Pretreatment
 - CSOs
 - Sewage Sludge
 - Special Studies, Evaluations, Other Requirements
- ☞ Standard Conditions for Industrial Facilities



Application

- receive application
- review for completeness and accuracy
- request additional information
- request endangered species list from services

Develop Draft Permit Limits and Conditions

- develop technology-based limits
- develop water quality-based limits
- apply most stringent limits
- develop monitoring conditions
- develop standard conditions
- consider variances and other regulations
- Prepare Fact Sheet & Supporting Documentation
- Prepare Biological Evaluation
 - (if endangered species present)
- Prepare Administrative Record

EPA/State review

Public Notice/Public Hearing

Prepare Final Permit & Administrative Record

EPA/State Review (401 Cert.)

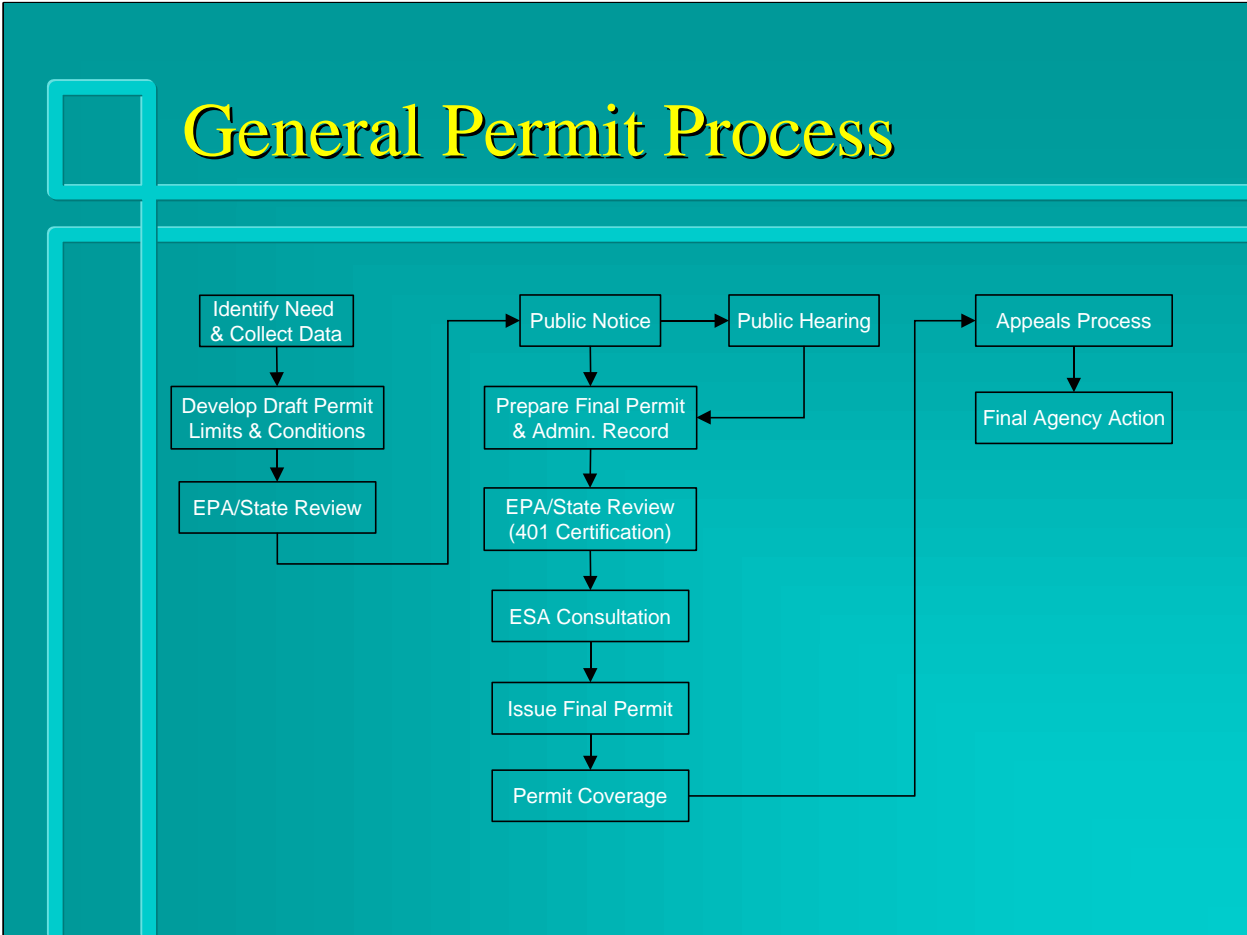
ESA Consultation (if endangered species present)

Issue Final Permit

Appeals Process

- Request for Evidentiary Hearing
- Opportunity for Informal Appeal to Environmental Appeals Board
- Formal Appeal to Environmental Appeals Board
- Environmental Appeals Board Decision

Final Agency Actions



Identify need & collect data

Permit & Fact Sheet development

- Effluent limits

- Monitoring conditions

- Standard conditions

- Special conditions

EPA/State review

Public Notice & public comments

Administrative record

EPA/State review (401 Cert.)

ESA Consultation

Final permit

Notice of intent to be covered

- EPA request more information

- EPA approve coverage

- EPA deny coverage => facility must apply for individual permit

Appeals Process

Final agency action

INDIVIDUAL NPDES PERMITS
December 16, 1992

NPDES Permit Process (Steps/Milestones)

References

Time

Notes/Comments

NPDES Permitting Process

Individual Permit

Applicant(s) submit Form 2D NPDES permit application for New Manufacturing, Commercial, Mining and Silvicultural Operations
Also, a copy of Alaska Coastal Project Questionnaire if appropriate

40 CFR 122.21(c)

180 days prior to start of discharge

NPDES Form 2D application must be accompanied by a completed Alaska Coastal Zone Questionnaire (if operations will be in the coastal resource area). Completion and submittal of the Coastal Project Questionnaires (CPQ) begin the State's multi-agency project review. The length and complexity of which depends on the permits required for the project. The Alaska Coastal Management Project (ACMP) review is coordinated by the Division of Governmental Coordination (DGC) and has several levels at which review may be halted (subsequently stopping clocks). Further information available from Alaska Division of Governmental Coordination.

Draft NPDES permit developed
Fact Sheet for permit conditions developed

40 CFR 124.6
40 CFR 124.8

30-360 days

Development time depends on nature of discharges and complexity of issues associated with the permit and/or operations. For example, endangered species consultation, technology-based effluent guidelines, water-quality based permit limits & application of mixing zones. Consultation with other state and/or federal agencies at this stage of the NPDES process may require additional time.

Preliminary draft NPDES permit sent to ADEC for review with respect to water quality standards

Joint Procedures Review referenced in F792 State/EPA Agreement with ADEC

2 weeks if time allows

Frequently takes longer than two weeks to satisfactorily complete discussion on various types of issues (e.g., interpretation of standards).

Draft NPDES permit goes to public notice

40 CFR 124.10
10/86 Joint Procedures Review Package (ADEC)

30 day minimum
45-90 days possible

Public Notice is a legal advertisement (in local newspapers) of EPA's plan to issue the permit. ADEC's plan to certify the permit under §401 of the Clean Water Act (i.e., compliance with water quality standards), and DGC's review for CZM consistency. Copies of permit, fact sheet, & advertisement are mailed to a list of state & federal agencies, environmental & citizens' groups, and other parties that have shown interest in the permit during its development. Receipt of the draft permit begins DGC's formal 50-day review of the permit with respect to CZM.

Public Hearings & Public Comment

40 CFR 124.11 & 124.12

30 day minimum

Hearings require 30 days' advance public notice (see 40 CFR 124.12). R10 has established the practice of tentatively scheduling public hearings (with details of how to request them, when & where they will be held if requested). The tentative public hearing schedule is "noticed" when the permit is initially "noticed" and is cancelled if insufficient interest is shown.

NPDES Permitting Process

INDIVIDUAL NPDES PERMITS
December 16, 1992

NPDES Permit Process (Steps/Milestones)	References	Time	Notes/Comments
Response to Public Comments	40 CFR 124.17	10-60 days or longer	Must be written. Comments may/may not result in changes to the permit. Time required to respond depends on the nature & depth of comments and the issues raised.
Proposed NPDES permit submitted to ADEC for certification under §401 of the Clean Water Act	40 CFR 124.53 10/86 Joint Procedures Review Package (ADEC)	60 days	EPA may waive ADEC's right to certify the permit if certification is not received within 60 days. When these final documents are received by EPA, the permit may be issued. The final permit, written response to comments, copy of 40 CFR 124.17, and various transmittal letters are mailed to those who received the initial public notice plus anyone who commented (at hearings or by letter) on the proposed permit.
EPA receives Final 401 Certification from ADEC and Conclusive Coastal Zone Consistency Determination from DGC			
Permit issued and may be effective	40 CFR 124.15	1-30 days	30 days allowed for commentors to request evidentiary hearing for issues/facts raised during public comment period. If no substantive issues are raised (& subsequently likely to be challenged) the permit may be effective immediately upon issuance.
- Immediately, or - 30 days from issuance	40 CFR 124.17		
Permit conditions may be challenged	40 CFR 124.74	within 30 days	Based on legal and/or factual issue. While decisions about the contested permit conditions are being made, those conditions are stayed (40 CFR 124.16). In the case of new facilities, new dischargers and new sources, the applicant/permittee shall be without a permit pending final agency action. See Alyeska timetable of issuance and litigation for the Alyeska Pipeline Service Company NPDES Permit.

GENERAL NPDES PERMITS
December 16, 1992

NPDES Permitting Process
General Permit

NPDES Permit Process (Steps/Milestones)	References	Time	Notes/Comments
<p>Applicant(s) submit Form 2D NPDES permit application for New Manufacturing, Commercial, Mining and Silvicultural Operations</p> <ul style="list-style-type: none"> - Also copy of Alaska Coastal Project Questionnaire if appropriate 	40 CFR 122.21(c)	180 days prior to discharge	<p>NPDES Form 2D application must be accompanied by a completed Alaska Coastal Zone Questionnaire (if operations will be in the coastal resource area). Completion and submittal of the Coastal Project Questionnaires (CPQ) begin the State's multi-agency project review, the length and complexity of which depends on the permits required for the project. The Alaska Coastal Management Project (ACMP) review is coordinated by the Division of Governmental Coordination (DGC) and has several levels at which review may be halted (subsequently stopping clocks). Further information available from Alaska Division of Governmental Coordination.</p> <p>If a general permit has been proposed, applicants may submit a notice of intent to be covered or a request for coverage under the permit when it is finally issued.</p>
Regional Administrator's decision to issue general permit (vs. individual permit)	40 CFR 122.28(a)(1) 40 CFR 122.29(a)(2)(ii)		
Draft NPDES permit developed	40 CFR 124.6	120-360 days	Development time depends on nature of discharges and complexity of issues associated with the permit and/or operations; for example, endangered species consultation, technology-based effluent guidelines, water-quality based permit limits & application of mixing zones. Consultation with other state and/or federal agencies at this stage of the NPDES process may require additional time.
Fact Sheet for permit conditions developed	40 CFR 124.8		
<p>Preliminary drafts of permit reviewed by</p> <ul style="list-style-type: none"> - ADEC (with respect to state's water quality standards) and 	Joint Procedures Review referenced in FY92 State/EPA Agreement with ADEC	2 weeks as time allows	ADEC Review: Frequently takes longer than two weeks to satisfactorily complete discussion on various types of issues (e.g., interpretation of standards)
<ul style="list-style-type: none"> - EPA HQ (for consistency with other Regions' permits of similar nature and effluent guidelines for the industrial categories involved) 	2/16/88 EPA Guidance on General NPDES Permits	2 weeks	EPA HQ Review: Frequently exceeds 2 weeks allowed, depending on the issues which may need to be resolved.

NPDES Permitting Process

GENERAL NPDES PERMITS December 16, 1992

NPDES Permit Process (Steps/Milestones)	References	Time	Notes/Comments
Draft NDPES permit goes to public notice in <u>Federal Register</u>	40 CFR 124.10	30 day minimum	Public Notice is a legal advertisement (in local newspapers) of EPA's plan to issue the permit, ADEC's plan to certify the permit under §401 of the Clean Water Act (i.e., compliance with water quality standards), and DGC's review for CZM consistency. Copies of permit, fact sheet, & advertisement are mailed to a list of state & federal agencies, environmental & citizens' groups, and other parties that have shown interest in the permit during its development. Receipt of the draft permit begins DGC's formal 50-day review of the permit with respect to CZM.
	2/16/88 EPA Guidance on General NPDES Permits	45-90 days possible	2/16/88 EPA Guidance requires that EPA-issued general permits must be "noticed" in the <u>Federal Register</u> . Although it is Region 10's practice to publish the general permit in toto, we need only publish the fact sheet and availability of the general permit (issuance & Promulgation of General Permits, p. 20). Note that OMB has waived review of EPA-issued general permits (11/3/83) and that issuance and promulgation activities are subject to the Administrative Procedures Act (5 USC 551, <u>et seq</u>) (issuance & Promulgation of General Permits, p. 21).
	10/86 Joint Procedures Review Package (ADEC)		Hearings require 30 days' advance public notice (see 40 CFR 124.12). R10 has established the practice of tentatively scheduling public hearings (with details of how to request them, when & where they will be held if requested). The tentative public hearing schedule is "noticed" when the permit is initially "noticed" and is cancelled if insufficient interest is shown.
Public Hearings and Public Comment	40 CFR 124.11 & 124.12	30 day minimum	
	2/16/88 EPA Guidance on General NPDES Permits		
Response to Public Comments	40 CFR 124.17	60 days or longer	Must be written. Comments may/may not result in changes to the permit. Time required to respond depends on the nature & depth of comments and the issues raised.
	2/16/88 EPA Guidance on General NPDES Permits		
Proposed NPDES permit submitted to ADEC for certification under §401 of the Clean Water Act	40 CFR 124.53	60 days	EPA may waive ADEC's right to certify the permit if certification is not received with 60 days.
	10/86 Joint Procedures Review Package (ADEC)		
EPA receives final §401 Certification from ADEC (and Conclusive Coastal Zone Consistency Determination from DGC, if appropriate)			

NPDES Permitting Process

GENERAL NPDES PERMITS December 16, 1992

NPDES Permit Process (Steps/Milestones)	References	Time	Notes/Comments
Signed & undated final permit (with any \$401 requirements added) is submitted to EPA HQ for internal review		2 weeks	Review at HQ level may take 3-4 weeks, or longer, if issues are raised for discussion. When issues are resolved, the permit is dated and published in the <u>Federal Register</u> .
Permit is approved, dated, and published in <u>Federal Register</u> . Permit may be effective <ul style="list-style-type: none"> - immediately - days from issuance 	2/16/88 EPA Guidance on General NPDES Permits 40 CFR 124.15 40 CFR 124.17	1-30 days	<p>The effective date of a general permit will be determined by the nature of changes made as a result of public comment and §553(c) of the Administrative Procedures Act. In Region 10 this means that permits are</p> <ul style="list-style-type: none"> - immediately effective when the final permit is equivalent to the draft permit and when the permit will cover some previously unpermitted point-source discharge (2/16/88 EPA Guidance on General NPDES Permits, issuance & Promulgation of General Permits, p. 23) - effective some time after the date of issuance when the final permit is not equivalent to the draft permit, particularly with respect to significant issues raised during the public comment period.
Permit conditions may be challenged	\$509(b)(1) of Clean Water Act	within 120 days	<p>Application to contest permit conditions may be made by any interested person in the Circuit Court of Appeals of the US for the Federal judicial district in which such person resides or in which the applicant's business will be affected by the permit condition. The time allowed for filing was changed from 90 to 120 days by the 1987 amendment of the Clean Water Act.</p>
<p>Applicant(s) submit Form 2D NPDES permit application for New Manufacturing, Commercial, Mining and Silvicultural Operations</p> <ul style="list-style-type: none"> - Also, a copy of Alaska Coastal Project Questionnaire if appropriate 	40 CFR 122.21(c)	180 days prior to start of discharge	<p>NPDES Form 2D application must be accompanied by a completed Alaska Coastal Zone Questionnaire (if operations will be in the coastal resource area). Completion and submittal of the Coastal Project Questionnaires (CPQ) begin the State's multi-agency project review, the length and complexity of which depends on the permits required for the project. The Alaska Coastal Management Project (ACMP) review is coordinated by the Division of Governmental Coordination (DGC) and has several levels at which review may be halted (subsequently stopping clocks). Further information available from Alaska Division of Governmental Coordination.</p>

NPDES National Program

- ◆ Municipal & Industrial Permit Program
- ◆ Pretreatment Program
- ◆ Federal Facilities Program
- ◆ General Permit Program
- ◆ Sludge Permit Program

•EPA is authorized under the CWA to directly implement the NPDES programs

NPDES Implementation

- ◆ States, Territories, or Tribes
- ◆ Implement all or parts of program
- ◆ Must have authorization by EPA
- ◆ EPA review and comment on permits

- States, Territories, or Tribes may be authorized to implement all or parts of the national program.
- Must be authorized for base program before seeking authorization for other programs
- EPA will implement programs not authorized to States, Territories, or Tribes.
- EPA may not issue general permits if the NPDES authorized State, Territory, or Tribe is not approved to implement the general permit program.
- Once a State, Territory, or Tribe is authorized to issue permits, EPA is prohibited from conducting these activities. However, EPA must be provided with an opportunity to review each permit and may formally object to elements that conflict with Federal requirements. If the State, Territory or Tribe does not address the objection points, EPA will issue the permit directly.
- Once a permit is issued through a government agency, it is enforceable by the approved State, Territory, or Tribe and Federal agencies (including EPA) with legal authority to implement and enforce the permit, and by private citizens (in Federal court).

State/Tribal Roles

- ◆ CWA Section 401 Certification
- ◆ Review & Certify
- ◆ Procedures for certification
- ◆ 60 days to grant or waive
- ◆ More stringent State laws
 - Letter justifying changes
 - Cite State regulations

- Under CWA Section 401(a)(1), EPA may not issue a permit until a certification is granted or waived.
- If EPA is preparing the draft permit, State certification is usually accomplished by allowing States to review and certify the application prior to draft permit preparation.
- Regulations in 40 CFR 124.53 and 124.54 describe procedures a permit writer should follow to obtain State or Tribal certification. Under these regulations, when a draft permit is prepared by EPA, but state certification has not yet been granted, EPA must send the State a copy of the draft permit along with a notice requesting State certification.
- If the State does not respond within 60 days, the State is deemed to have waived its right to certify.
- If the state chooses to certify the draft permit, the state may only require changes to the draft permit to incorporate more stringent state laws.
 - the state must send EPA a letter justifying the changes
 - cite state regulations that support the changes

Objectives of Workshop



- ✓ Overview of statutes & regulations
- ✓ Permit process
 - Types of effluent limits
 - Other permit conditions
 - Other permitting considerations
 - Administrative process
 - Compliance & enforcement

Types of Effluent Limit

- ◆ Technology-based
- ◆ Water quality-based
 - Numeric
 - Narrative

When effluent limits are developed for an NPDES permit, consideration must be given to both the technology available to treat pollutants (technology-based effluent limits), and limits that are protective of the designated uses of the receiving water (water quality-based effluent limits).

Technology-Based Effluent Limits

- ◆ Goals
- ◆ Industrial dischargers
 - National effluent limitation guidelines (ELGs)
 - Best professional judgement (BPJ)
- ◆ Municipal dischargers (POTWs)
 - Secondary treatment standards
 - Equivalent to secondary treatment

Goals

- ◆ Establish minimum control levels
- ◆ Provide equity to categorical dischargers

- The intent of a technology-based effluent limitation is to require a minimum level of treatment for industrial/municipal point sources based on currently available treatment technologies while allowing the discharger to use any available control techniques to meet the limitations. In some cases, effluent limits based on ELGs and BPJ (as well as water quality considerations) may be included in a single permit.

- National ELGs are developed based on the demonstrated performance of a reasonable level of treatment that is within the economic means of specific categories of industrial facilities.

- Where national ELGs have not been developed, the same performance-based approach is applied to a specific industrial facility based on the permit writer's BPJ.

- Secondary treatment is the biological treatment component at a municipal wastewater treatment plant. The secondary treatment regulations identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD, TSS, and pH. The regulations provide for special considerations regarding combined sewers, industrial wastes (pretreatment), waste stabilization ponds, and less concentrated influent wastewater for combined and separate sewers.



Effluent Limitation Guidelines have been established for more than 50 different industrial categories. They can be found at 40 CFR 400-499. Development Documents provide the basis for the ELGs.

- BPT (best practicable control technology currently available) is the average of the best existing performance by well operated plants within each industrial category or subcategory. This applies to all types of pollutants. Effluent limits must be justified in terms of the total cost of industry wide application of the technology in relation to the effluent reduction benefits to be achieved. No compliance schedule is allowed.
- BCT (best conventional pollutant control technology) is the same as BAT except that it only applies to conventional pollutants. No compliance schedule is allowed.
- BAT (best available technology economically achievable) is the very best control and treatment measures that have been or are capable of being achieved. This applies to toxic and nonconventional pollutants. Cost attainability must be considered, but is not required to be compared against effluent reduction benefit. No compliance schedule is allowed.
- NSPS (new source performance standards) are the best available demonstrated control technology, processes, operating methods, or other alternatives including, where practicable, standards permitting no discharge of pollutants. NSPSs are effective on the date of the commencement of a new facility's operation and the facility must demonstrate compliance within 90 days.
- BPJ (best professional judgement) is the highest quality technical opinion developed by a permit writer after consideration of all reasonably available and pertinent data or information that forms the basis for the terms and conditions of a NPDES permit. BPJ is applied on a case-by-case basis when ELGs are not available.

ELG Considerations

- ◆ Categorization
- ◆ Multiple products or categories
- ◆ Production/flow-based limitations
- ◆ Tiered limits
- ◆ Mass vs.. concentrations limits

Derivation of effluent limits requires knowledge of ELGs applicable to the permittee. In order to properly apply ELGs, there are several considerations that must be made:

- Categorization - determination of the proper category and subcategory of the facility and proper use of the guidelines applicable to the category or subcategory under consideration.
- Multiple products or categories - classification of plants that fall under more than one subcategory and/or have multiple products with multiple measures of production.
- Production/flow-based limitations - determination of the appropriate measure of production or flow.
- Tiered permit limits - use of alternate limits for varying production and flow scenarios.
- Mass vs. concentration limits - express limit as mass unless guideline allows, or parameter requires, concentration-based limits.
 - parameter examples: pH, temp., radiation
 - guideline examples: mg/m², mg/mwh
 - other: batch operation, mixing effluents (dilution)

BPJ Considerations

■ BPT

- technology cost vs. effluent reduction benefit
- * age of facility & equipment
- * process used
- * engineering aspects of control techniques
- * process changes
- * environmental impact

■ BCT

- cost of effluent reduction vs. effluent reduction benefit
- compare cost and benefits of reduction to POTW category
- * same as items in BPT

■ BAT

- cost of effluent reduction
- * same as items in BPT

Information can be obtained from

- Abstracts of industrial NPDES permits (USEPA, 1993. *NPDES Industrial Permit Abstract 1993*. EPA-833/B-93-005. Office of Water)
- Treatability manual and database (USEPA, 1980. *Treatability Manual, Volumes I-V*. EPA-600/ii8-80-042a-e. Office of Research and Development)
- NPDES BMP Guidance document (USEPA, 1993. *Guidance Manual for Developing Best Management Practices. (BMPs)*. EPA-833-B-93-004)
- TSD (USEPA, 1991. *Technical Support Document for Water Quality-Based Toxics Control*. EPA-505/2-90-001. Office of Water Enforcement and Permits)
- Economic achievability protocol (USEPA, 1982. *Workbook for Determining Economic Achievability for National Pollutant Discharge Elimination System Permits (DRAFT)*. Permits Division Prepared by Putnam, Waayes & Bartlett, Inc.)
- Development documents
- Proposed regulations
- Model permits
- General permits information exchange database
- DMRs
- Compliance inspection reports
- Industry teams/national experts



Example: Cost Considerations

Proposed Treatment Option	A	B	C
Influent Concentration	10	10	10
Effluent Concentration	5	8	60
Pounds Removed	150	75	100
Treatment Cost (\$)	600	750	200
BPT (\$/lb)	4	10	2
BAT (Economically Achievable?)	Yes	No	Yes

Since option B is not economically achievable, it will not be further considered.

When looking at BAT, consider most lbs removed.

When looking at BPT, consider lowest \$ per lb.

Therefore option A would be the BAT limit and option C would be the BPT limit.

Since option A is most restrictive, it would be the basis for the effluent limit.

Municipal Dischargers	
<u>Secondary Treatment</u>	<u>Equivalent to Secondary Treatment</u>
<ul style="list-style-type: none"> – BOD (30/45) <ul style="list-style-type: none"> » can substitute BOD with CBOD (25/40), COD or TOC – TSS (30/45) – pH (6-9) – % removal (>85%) – Limits <ul style="list-style-type: none"> » mass-based using design flow (required) » concentration-based (optional) 	<ul style="list-style-type: none"> – Lagoons or trickling filter <ul style="list-style-type: none"> » BOD (max. 45/65) » TSS (max. 45/65) » % removal (>65%) – CSOs – Industrial wastes (pretreatment) – I/I – 301(h) facilities – Biological treatment = 51 + % of treatment – Plant exceeds 30/30 with proper O&M – No water quality impact – No overloaded facilities – No new facilities

The CWA established “secondary treatment” as the performance standard for all POTWs. Secondary treatment standards are applied to other treatment works (e.g., private or federal) as BPJ. Standards are located at 40 CFR 133.

•Basing limits on CBOD instead of BOD eliminates the impact of nitrification. Where nitrification is occurring in a treatment works (e.g., summertime), BOD may not provide a reliable measure of the oxygen demand because nitrifying bacteria use a large amount of oxygen to convert ammonia and nitrite to nitrate.

•COD and TOC can be used in lieu of BOD when a long-term BOD:COD or BOD:TOC correlation has been demonstrated.

Exceptions to Secondary Treatment

- CSO’s - % removal can be decreased during wet weather events
- Industrial wastes - (1)less than BOD & TSS for ELGs, (2)flow or loading from industry exceeds 10% design flow or loading of POTW
- Infiltration/Inflow - (1)meet concentration but not % removal, (2)applying % removal would result in more stringent concentration limits, (3)not result of excessive I/I
- 301(h) waiver for marine discharges
- the biological treatment process must remove largest percentage BOD & TSS
- effluent quality in excess of 30 mg/L BOD & TSS is consistently achieved, despite proper O&M
- water quality is not adversely affected
- A treatment works that is operating beyond its design hydraulic or organic loading limit is not considered an eligible facility. If overloading or structural failure is causing poor performance, the solution to the problem is construction, not effluent limitations adjustment.

Water Quality-Based Effluent Limits

- ◆ Water quality standards (WQS)
- ◆ Reasonable potential
- ◆ Wasteload allocations
- ◆ Permit limit derivation
- ◆ Whole effluent toxicity (WET)

Water Quality Standards

- ◆ Developed by states
- ◆ All “waters of the U.S.”
- ◆ Approved by EPA
- ◆ Reviewed every 3 years

Water quality standards define the water quality goals of a waterbody.

- Section 303(c) of the CWA requires every state to develop water quality standards applicable to all water bodies or segments of water bodies that lie within the state boundaries.
- EPA must approve or disapprove WQSs. EPA’s review is to ensure that the state’s water quality standards meet the requirements of the CWA and the WQS Regulation. EPA may promulgate a new or revised standard for a state where necessary to meet the requirements of the CWA.
- States are required to review their water quality standards at least once every three years and revise them as necessary. The most current water quality standards are used in developing permit limits.

Water Quality Standard Components

- ◆ Designated uses
- ◆ Water quality criteria
- ◆ Antidegradation policy

Water quality standards should:

- (1) include provisions for restoring and maintaining the chemical, physical, and biological integrity of state waters
- (2) provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water (“fishable/swimmable”), and
- (3) consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation.

Designated Uses in Idaho

◆ Aquatic life

- cold water biota
- warm water biota
- salmonid spawning
- bull trout



◆ Human health

- recreation
 - » primary
 - » secondary
- public water supply



◆ Agriculture

- irrigation
- livestock



Designated uses should support the “fishable/swimmable” goal of Section 101(a)(2) of the CWA where such uses are attainable.

A state must perform Use Attainability Analysis under 40 CFR 131.10(j) when:

- (1) a waterbody is not designated for “fishable/swimmable” use
- (2) removing “fishable/swimmable” designated use from a waterbody
- (3) adopting subcategories a designated “fishable/swimmable” use that would require less stringent criteria.

The analysis may include physical, chemical, biological, and economic factors as described in 40 CFR 131.10(g).

Idaho Water Quality Criteria

♦ Numeric

- values
- chemical specific
- aquatic life
 - » acute (1-hour average)
 - » chronic (4-hour average)
- human health

♦ Narrative

- statement of goals
- “no toxics in toxic amounts”
- “free from objectionable color, odor, taste, and turbidity”

Numeric water quality criteria are values expressed as levels, concentrations, toxic units, etc. for chemical specific pollutants. States may adopt EPA criteria guidance (modified to reflect site specific conditions) or develop criteria based on scientifically defensible methods.

Aquatic Life Criteria is designed to protect aquatic organisms, including plants and animals.

- Two types of criteria: acute and chronic.

- Consists of three components

Magnitude - the level of pollutant (or pollutant parameter), generally expressed as a concentration

Duration - the period of time (averaging period) over which the instream concentration is averaged for comparison with criteria concentrations

Frequency - how often criteria can be exceeded

Human Health Criteria is a single expression of the highest pollutant concentration not expected to pose significant long-term risk to human health

- Assumed life expectancy is 70 years

- Based on chronic exposure via consumption of water and/or aquatic life

- Accounts for bioconcentration/bioaccumulation

Narrative criteria are statements that describe the desired water quality goals. They can be the basis for limiting specific pollutant where the state has no numeric criteria.

EPA Water Quality Criteria

- ◆ 1968 Green
- ◆ 1973 Blue (Agriculture)
- ◆ 1976 Red
- ◆ 1980 Toxics
- ◆ 1986 Gold (Aquatic life & Human health)

Components of an Integrated Approach to Water Quality-Based Toxics Control

Control Approach	Capabilities	Limitations
Chemical-Specific	<ul style="list-style-type: none"> < Human health protection < Complete toxicology < Straightforward treatability < Fate understood < Less expensive testing if only a few toxicants are present < Prevents impacts 	<ul style="list-style-type: none"> < Does not consider all toxics present < Bioavailability not measured < Interactions of mixtures (e.g., additivity) unaccounted for < Complete testing can be expensive < Direct biological impairment not measured
Whole Effluent Toxicity	<ul style="list-style-type: none"> < Aggregate toxicity < Unknown toxicants addressed < Bioavailability measured < Accurate toxicology < Prevents impacts 	<ul style="list-style-type: none"> < No direct human health protection < Incomplete toxicology (few species may be tested) < No direct treatment < No persistency or sediment coverage < Conditions in ambient may be different < Incomplete knowledge of causative toxicant
Bioassessments	<ul style="list-style-type: none"> < Measures actual receiving water effects < Historical trend analysis < Assesses quality above standards < Total effect of all sources 	<ul style="list-style-type: none"> < Critical flow effects not always assessed < Difficult to interpret impacts < Cause of impact not identified < No differentiation of sources < Impact has already occurred < No direct human health protection

Future Water Quality Criteria

- ◆ Biological
- ◆ Sediment
- ◆ Wildlife

Three new areas where criteria are being developed include biological, sediment, and wildlife criteria.

- Biological criteria - EPA is developing numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting unimpaired waters of a designated aquatic life use. The biological communities in these waters represent the best attainable condition for the organisms. According to EPA policy, states should develop and implement biological criteria in their water quality standards.
- Sediment criteria - Sediment contamination can result from the deposition of toxicants over long periods of time and is also responsible for water quality impacts when these toxicants are released back into the water column. EPA has proposed sediment criteria for five organic chemicals (phenanthrene, fluoranthene, dieldrin, acenaphthene, and endrin) (59 FR 2652; 1/18/94). EPA also is developing sediment criteria for metals, and has begun development of implementation guidance for sediment criteria.
- Wildlife criteria - EPA is undertaking an initiative to develop numeric wildlife criteria to establish ambient concentrations of certain chemicals to protect mammals and birds from adverse impacts due to consumption of food and/or water containing those chemicals.

Antidegradation

- ◆ Protects uses
- ◆ Three tiers
 - Tier I: existing uses
 - Tier II: aquatic life, wildlife, & recreation
 - Tier III: outstanding resource waters

Each state is required to adopt an antidegradation policy consistent with EPA's antidegradation regulations (40 CFR 131.12) and to identify the methods it will use for implementing the policy.

- Antidegradation ensures that once a use is achieved, it will be maintained.
- Antidegradation provides three tiers of protection from degradation of water quality

Tier I - Level of quality necessary to protect the existing uses of a water segment

Tier II - Protection of actual water quality where water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water.

Tier III - Special protection of waters designated as Outstanding National Resource Waters (ONRW).

National & State parks

Wildlife refuge

Ecologically unique water that need additional protection or are of a special significance (i.e., swamps, hot springs, etc.)

Reasonable Potential

- ◆ General considerations
- ◆ Numeric criteria
 - with effluent monitoring data
 - without effluent monitoring data
- ◆ Narrative criteria

Once the applicable designated uses and water quality criteria for a water body are determined, an analysis must be conducted to ensure that dischargers do not cause, have the reasonable potential to cause, or contribute to an excursion of numeric or narrative water quality criteria. EPA's regulation at 40 CFR 122.44(d)(1) establishes the basis for determining if there is an excursion of the numeric or narrative water quality criteria.

General Considerations

- ◆ Existing controls
- ◆ Variability of pollutant
- ◆ Sensitivity to toxicity species
- ◆ Dilution

When determining whether WQBELs are needed, the following should be considered:

- existing controls on point and nonpoint sources of pollution
- the variability of the pollutant or pollutant parameter in the effluent
- the sensitivity of the species to toxicity testing
- the dilution of the effluent in the receiving water, if applicable

Numeric Criteria

◆ With effluent data

- mass balance equation
 $Q_e C_e + Q_u C_u = Q_d C_d$
- projected maximum effluent concentration
 $C_e = \text{MOEC} \times \text{RPM}$
- dilution available
- $C_e > \text{criterion} \Rightarrow \text{need WQBEL}$
- $C_e < \text{criterion} \Rightarrow \text{no WQBEL}$

◆ Without effluent data

- effluent variability
- point/nonpoint source controls
- species sensitivity
- dilution

•EPA recommends that monitoring data be generated prior to permit limit development because (1) the presence or absence of a pollutant can be more clearly established or refuted, and (2) effluent variability can be more clearly defined.

•The mass balance equation is a simple water quality model that can be used for reasonable potential analysis. The water quality model projects the downstream concentration (C_d) under critical conditions and if the projected concentration exceeds the applicable numeric water quality criterion for a specific pollutant, there is reasonable potential and a WQBEL must be developed.

•The projected maximum effluent concentration is the product of the maximum observed effluent concentration and a statistically derived reasonable potential multiplier.

•If a mixing zone is authorized, then the dilution available from the upstream river flow is used in the calculations.

•A WQBEL can be set for a pollutant based on the available dilution and the water quality criterion in the absence of facility specific effluent monitoring data. In justifying the limit, the more information acquired to support the limit the better the position for defending the limit.

- compliance history problems & history of toxic impacts
- existing treatment technology, type of industry, BMPs
- In-stream data, criteria & designated uses, toxic impact to fish species
- critical stream flow & authorization of mixing zone

Example: Reasonable Potential with Effluent Data

Water Quality Model - Mass Balance Equation

$$Q_e C_e + Q_u C_u = Q_d C_d$$

Q_e = effluent flow (mgd)

C_e = effluent concentration (mg/L)

Q_u = available upstream river dilution (mgd)

C_u = upstream river concentration (mg/L)

$Q_d = Q_e + Q_u$ (mgd)

C_d = downstream river concentration (mg/L)

Example: Reasonable Potential with Effluent Data

Projecting a Maximum Value for C_e

Option 1: take maximum value of 330 samples

Option 2: project maximum value statistically

Number of samples (n) = 8

CV = 0.6 (default if $n < 10$)

MOEC = 1.5 mg/L

RPM = 3.3 (see table 3-1, TSD)

$C_e = 1.5 \times 3.3 = 5.0 \text{ mg/L}$

Must consider uncertainty associated with sparse data sets and effluent variability, therefore, statistical approach is used to project a maximum value.

Table 3-1. Reasonable Potential Multiplying Factors: 99% Confidence Level and 99% Probability Basis

Number of Samples	Coefficient of Variation																			
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1	1.6	2.5	3.9	6.0	9.0	13.2	18.9	26.5	36.2	48.3	63.3	81.4	102.8	128.0	157.1	90.3	227.8	269.9	316.7	368.3
2	1.4	2.0	2.9	4.0	5.5	7.4	9.8	12.7	16.1	20.2	24.9	30.3	36.3	43.0	50.4	58.4	67.2	76.6	86.7	97.5
3	1.4	1.9	2.5	3.3	4.4	5.6	7.2	8.9	11.0	13.4	16.0	19.0	22.2	25.7	29.4	33.5	37.7	42.3	47.0	52.0
4	1.3	1.7	2.3	2.9	3.8	4.7	5.9	7.2	8.7	10.3	12.2	14.2	16.3	18.6	21.0	23.6	26.3	29.1	32.1	35.1
5	1.3	1.7	2.1	2.7	3.4	4.2	5.1	6.2	7.3	8.6	10.0	11.5	13.1	14.8	16.6	18.4	20.4	22.4	24.5	26.6
6	1.3	1.6	2.0	2.5	3.1	3.8	4.6	5.5	6.4	7.5	8.6	9.8	11.1	12.4	13.8	15.3	16.8	18.3	19.9	21.5
7	1.3	1.6	2.0	2.4	2.9	3.6	4.2	5.0	5.8	6.7	7.7	8.7	9.7	10.8	12.0	13.1	14.4	15.6	16.9	18.2
8	1.2	1.5	1.9	2.3	2.8	3.3	3.9	4.6	5.3	6.1	6.9	7.8	8.7	9.6	10.6	11.6	12.6	13.6	14.7	15.8
9	1.2	1.5	1.8	2.2	2.7	3.2	3.7	4.3	5.0	5.7	6.4	7.1	7.9	8.7	9.6	10.4	11.3	12.2	13.1	14.0
10	1.2	1.5	1.8	2.2	2.6	3.0	3.5	4.1	4.7	5.3	5.9	6.6	7.3	8.0	8.8	9.5	10.3	11.0	11.8	12.6
11	1.2	1.5	1.8	2.1	2.5	2.9	3.4	3.9	4.4	5.0	5.6	6.2	6.8	7.4	8.1	8.8	9.4	10.1	10.8	11.5
12	1.2	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.2	4.7	5.2	5.8	6.4	7.0	7.5	8.1	8.8	9.4	10.0	10.6
13	1.2	1.4	1.7	2.0	2.3	2.7	3.1	3.6	4.0	4.5	5.0	5.5	6.0	6.5	7.1	7.6	8.2	8.7	9.3	9.9
14	1.2	1.4	1.7	2.0	2.3	2.6	3.0	3.4	3.9	4.3	4.8	5.2	5.7	6.2	6.7	7.2	7.7	8.2	8.7	9.2
15	1.2	1.4	1.6	1.9	2.2	2.6	2.9	3.3	3.7	4.1	4.6	5.0	5.4	5.9	6.4	6.8	7.3	7.7	8.2	8.7
16	1.2	1.4	1.6	1.9	2.2	2.5	2.9	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.5	6.9	7.3	7.8	8.2
17	1.2	1.4	1.6	1.9	2.1	2.5	2.8	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
18	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.4	3.7	4.1	4.4	4.8	5.2	5.6	5.9	6.3	6.7	7.0	7.4
19	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.6	4.0	4.3	4.6	5.0	5.3	5.7	6.0	6.4	6.7	7.1
20	1.2	1.3	1.6	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.2	5.5	5.8	6.1	6.5	6.8

Table 3-2. Reasonable Potential Multiplying Factors: 99% Confidence Level and 95% Probability Basis

Number of Samples	Coefficient of Variation																			
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1	1.4	1.9	2.6	3.6	4.7	6.2	8.0	10.1	12.6	15.5	18.7	22.3	26.4	30.8	35.6	40.7	46.2	52.1	58.4	64.9
2	1.3	1.6	2.0	2.5	3.1	3.8	4.6	5.4	6.4	7.4	8.5	9.7	10.9	12.2	13.6	15.0	16.4	17.9	19.5	21.1
3	1.2	1.5	1.8	2.1	2.5	3.0	3.5	4.0	4.6	5.2	5.8	6.5	7.2	7.9	8.6	9.3	10.0	10.8	11.5	12.3
4	1.2	1.4	1.7	1.9	2.2	2.6	2.9	3.3	3.7	4.2	4.6	5.0	5.5	6.0	6.4	6.9	7.4	7.8	8.3	8.8
5	1.2	1.4	1.6	1.8	2.1	2.3	2.6	2.9	3.2	3.6	3.9	4.2	4.5	4.9	5.2	5.6	5.9	6.2	6.6	6.9
6	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.9	3.1	3.4	3.7	3.9	4.2	4.5	4.7	5.0	5.2	5.5	5.7
7	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9
8	1.1	1.3	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.6	2.8	3.0	3.2	3.3	3.5	3.7	3.9	4.0	4.2	4.3
9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.8	2.9	3.1	3.2	3.4	3.5	3.6	3.8	3.9
10	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.8	3.0	3.1	3.2	3.3	3.4	3.6
11	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.5	2.7	2.8	2.9	3.0	3.1	3.2	3.3
12	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.0
13	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9
14	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.6	2.7
15	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.5
16	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4
17	1.1	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3
18	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2
19	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.1
20	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0

Example: Reasonable Potential with Effluent Data

Determine Reasonable Potential

$$Cd = \frac{(Q_e C_e + Q_u C_u)}{Q_d}$$

$$Cd_{acute} = \frac{(0.31)(5.0) + (1.2)(0.8)}{(1.51)} = 1.7 \text{ mg/L}$$

$$Cd_{chronic} = \frac{(0.31)(5.0) + (3.6)(0.8)}{(3.91)} = 1.1 \text{ mg/L}$$

Qu = dilution * critical flow
dilution = 25%
1Q10 = 4.8 cfs
7Q10 = 14.4 cfs
Qu_{acute} = 0.25 x 4.8 = 1.2 cfs
Qu_{chronic} = 0.25 x 14.4 = 3.6 cfs
Qe = 0.31 cfs
Ce = 5.0 mg/L
Cu = 0.8 mg/L
Qd_{acute} = 1.51 cfs
Qd_{chronic} = 3.91 cfs

Water Quality Criterion
Acute 1.0 mg/L
Chronic 0.9 mg/L

Example: Reasonable Potential with Effluent Data

Determine Reasonable Potential

Is Cd > water quality criterion?

1.7 mg/L > 1.0 mg/L yes

1.1 mg/L > 0.9 mg/L yes

Need WQBEL

If any Cd is greater than the associated water quality criterion, the a WQBEL is needed for that pollutant parameter.

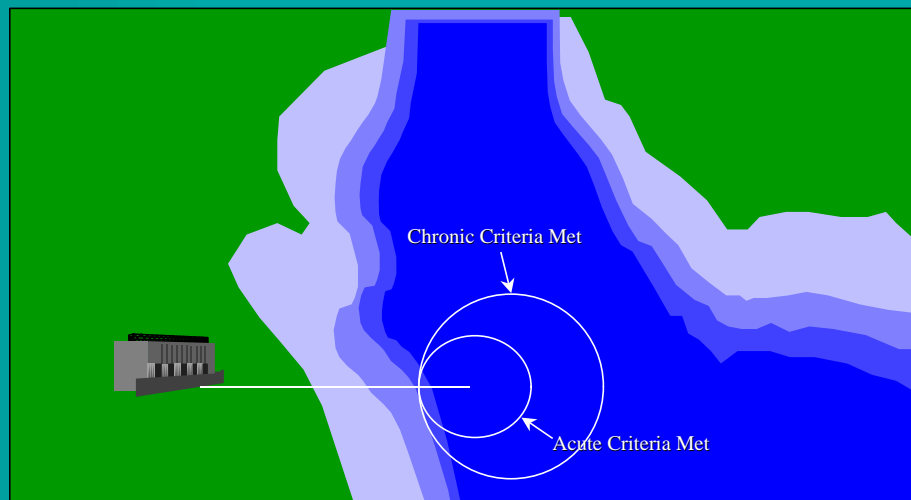
Wasteload Allocation

- ◆ Total Maximum Daily Load (TMDL)
- ◆ Calculate WLA
 - Mixing Zone Assessment
 - Complete Mix Assessment
 - » Steady State
 - » Dynamic

In order to calculate a WQBEL, a wasteload allocation (WLA) must first be determined. The WLA is the allowable amount of a pollutant that a discharger can put into a receiving water body without causing or contributing to the degradation of the designated uses for that waterbody.

- When a TMDL has been completed for a waterbody, the WLAs for pollutants addressed in the TMDL have been established for each point source discharger and WQBELs can be derived from those WLAs.
- When a TMDL has not been completed for a waterbody, the WLAs for pollutants must be calculated, taking into consideration pollutant loadings from other sources.
- CWA does not require attaining water quality criteria at the end-of-pipe. A mixing zone is an allocated impact zone in the receiving water where acute and chronic water quality criteria can be exceeded as long as toxic conditions are prevented and the designated use of the water is not impaired as a result of the mixing zone. In Idaho, mixing zones are allowed and determined by IDEQ. The standard mixing zones in Idaho are: Aquatic life = 25%, Human health = 100%. There are two stages of mixing: discharge induced and ambient induced. The first stage is controlled by discharge jet momentum and buoyancy of the effluent. The latter stage of mixing is controlled by ambient turbulence.
- A mixing zone assessment is required when there is not rapid and complete mixing. Rapid and complete mixing occurs when lateral variation in concentration in the direct vicinity of the outfall is small (e.g., <5-25%) and generally occurs from effluent dominated systems or diffuser across stream.
- For completely mixed discharge receiving water situations, there are two major types of fate and transport water quality models: steady-state and dynamic.
- Steady-state modeling is based on the mass balance equation and is used by EPA in developing WLAs.
- Dynamic modeling requires extensive data collection of pollutants and environmental conditions and complex models. There are several types of dynamic models available, and it is imperative that the appropriate model be chosen to ensure accuracy of predicted concentrations in the waterbody. EPA performs this type of modeling only on a limited basis.

Mixing Zone



Mixing zone assessments are determined from field studies or modeling. Field studies include actual measurement of instream contaminant concentrations or dye studies. Dynamic models can also be used to determine mixing zones. The model must be calibrated to actual observation and simulate the critical conditions of the water body.

Example: Calculate WLA

$$WLA = Ce = \frac{QdCd - QuCu}{Qe}$$

Note:
Cd = water quality criterion

$$WLA_{acute} = Ce = \frac{(1.51)(1.0) - (1.2)(0.8)}{0.31} = 1.8 \text{ mg/L}$$

$$WLA_{chronic} = Ce = \frac{(3.91)(0.9) - (3.6)(0.8)}{0.31} = 2.1 \text{ mg/L}$$

Permit Limit Derivation

- ◆ Aquatic Life
 - Calculate LTAs
 - Select lowest LTA
 - Calculate MDL & AML
- ◆ Human Health & Agriculture
 - AML = WLA
 - Calculate MDL

The objective of permit limits is to meet the WLA under normal operating conditions virtually all the time. It is not possible to guarantee, through permit limits, that a WLA will never be exceeded. However, it is possible to account for extreme values and establish low probabilities of exceedance of the WLA in conformance with the duration and frequency requirements of the water quality standards. Permit limits must: be enforceable, account for effluent variability, consider available dilution, be protective of acute and chronic impacts, account for sampling frequency, and assure attainment of WLAs and WQSs.

The major assumption in the statistical derivation of permit limits is that the effluent distribution is log-normally distributed.

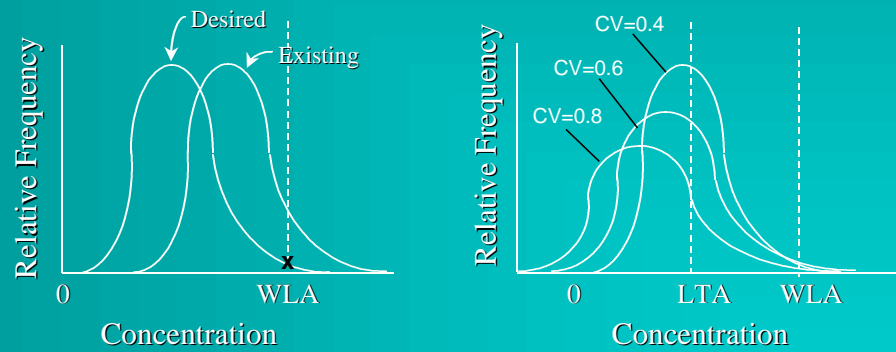
Long-term averages (LTAs) are treatment performance levels that need to be calculated from WLAs because a WLA is “never to be exceeded”. This is characterized by using a probability (e.g., the WLA is the 99th percentile concentration on the log normal effluent distribution).

Selecting the lowest LTA protects both acute and chronic WLAs and sets one treatment design basis.

NPDES regulations (40 CFR 122.45) require all permit limits be expressed as maximum daily limits (MDLs) and average monthly limits (AMLs). Calculating MDLs and AMLs sets upper bound estimates, allows comparison of WQBELs to technology-based limits, and ties the AML to the planned frequency of monitoring.

Determining permit limits for pollutants affecting human health is somewhat different from setting limits for other pollutants because the exposure period is generally longer than one month and the average exposure, rather than the maximum exposure, is usually of concern. If the procedures used for aquatic life protection were applied in the development permit limits for human health pollutants, both MDLs and AMLs would exceed the WLA.

Aquatic Life Calculate LTAs



The goal is to reduce effluent concentrations to below the WLA.

The desired distribution can be characterized by the LTA and coefficient of variation (CV).



Aquatic Life Calculate LTAs

Acute	Chronic
$LTA_{a,c}=WLA_{a,c}\exp[0.5\sigma^2-z\sigma]$	$LTA_c=WLA_c\exp[0.5\sigma_4^2-z\sigma_4]$
$\sigma^2=\ln[CV^2+1]$	$\sigma_4^2=\ln[(CV^2/4)+1]$
$z=2.326$ for 99th percentile occurrence probability	$z=2.326$ for 99th percentile occurrence probability

Table 5-1. Back Calculations of Long-Term Average

CV	WLA Multipliers	
	$e^{[0.5 \sigma^2 - z \sigma]}$	
	95th Percentile	99th Percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

$$LTA_{a,c} = WLA_{a,c} \cdot e^{[0.5 \sigma^2 - z \sigma]}$$

where $\sigma^2 = \ln [CV^2 + 1]$,
 $z = 1.645$ for 95th percentile occurrence probability, and
 $z = 2.326$ for 99th percentile occurrence probability

<p>Chronic (4-day average)</p> $LTA_c = WLA_c \cdot e^{[0.5 \sigma_4^2 - z \sigma_4]}$ <p>where $\sigma_4^2 = \ln [CV^2 / 4 + 1]$, $z = 1.645$ for 95th percentile occurrence probability, and $z = 2.326$ for 99th percentile occurrence probability</p>	CV	WLA Multipliers	
		$e^{[0.5 \sigma_4^2 - z \sigma_4]}$	
		95th Percentile	99th Percentile
	0.1	0.922	0.891
	0.2	0.853	0.797
	0.3	0.791	0.715
	0.4	0.736	0.643
	0.5	0.687	0.581
	0.6	0.644	0.527
	0.7	0.606	0.481
	0.8	0.571	0.440
	0.9	0.541	0.404
	1.0	0.514	0.373
	1.1	0.490	0.345
	1.2	0.468	0.321
	1.3	0.449	0.300
	1.4	0.432	0.281
	1.5	0.417	0.264
	1.6	0.403	0.249
	1.7	0.390	0.236
	1.8	0.379	0.224
	1.9	0.369	0.214
	2.0	0.360	0.204

Aquatic Life

Example: Calculate LTAs

Acute

$$CV = 0.6$$

$$WLA_a = 1.8 \text{ mg/L}$$

$$LTA_{a,c} = 0.58 \text{ mg/L}$$

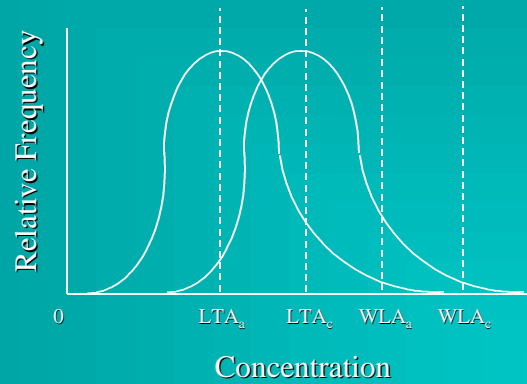
Chronic

$$CV = 0.6$$

$$WLA_c = 2.1 \text{ mg/L}$$

$$LTA_c = 1.1 \text{ mg/L}$$

Aquatic Life Select the Lowest LTA



Since there are two LTAs, the most stringent one should be used to ensure protection of acute and chronic WLAs and to set one treatment design basis.

The lowest LTA is usually the acute, but sometime is the chronic. Therefore, both must be calculated and compared.

Aquatic Life

Example: Select Lowest LTA

◆ $LTA_{a,c} = 0.58 \text{ mg/L}$

◆ $LTA_c = 1.1 \text{ mg/L}$

Lowest LTA = $LTA_{a,c}$

Aquatic Life

Calculate MDL & AML

MDL	AML
$MDL=LTA*\exp[0.5\sigma^2-z\sigma]$	$AML=LTA*\exp[0.5\sigma_n^2-z\sigma_n]$
$\sigma^2=\ln[CV^2+1]$	$\sigma_n^2=\ln[(CV^2/n)+1]$
$z=2.326$ for 99th percentile occurrence probability	$z=1.645$ for 95th percentile occurrence probability

Table 5-2. Calculation of Permit Limits

CV	LTA multipliers	
	$e^{[z\sigma - 0.5\sigma^2]}$	
	95th Percentile	99th Percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

Maximum Daily Limit

$MDL = LTA \cdot e^{[z\sigma - 0.5\sigma^2]}$

where $\sigma^2 = \ln[CV^2 + 1]$,
 $z = 1.645$ for 95th percentile occurrence probability, and
 $z = 2.326$ for 99th percentile occurrence probability

Average Monthly Limit	CV	LTA Multipliers									
		$e^{[z\sigma_n - 0.5\sigma_n^2]}$									
		95th Percentile					99th Percentile				
		n=1	n=2	n=4	n=10	n=30	n=1	n=2	n=4	n=10	n=30
<p>$AML = LTA \cdot e^{[z\sigma_n - 0.5\sigma_n^2]}$</p> <p>where $\sigma_n^2 = \ln[CV^2 / n + 1]$, $z = 1.645$ for 95th percentile, $z = 2.326$ for 99th percentile, and n = number of samples/month</p>	0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
	0.2	1.36	1.25	1.17	1.12	1.06	1.55	1.37	1.25	1.16	1.09
	0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
	0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
	0.5	1.95	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
	0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
	0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
	0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
	0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
	1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
	1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
	1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
	1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
	1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
	1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
	1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
	1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
	1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
	1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
	2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

Aquatic Life

Example: Calculate MDL & AML

MDL

AML

$CV = 0.6$

$CV = 0.6$

LTA=1.8 mg/L

LTA=1.8 mg/L

$n=8$

MDL= 1.8 mg/L

AML=0.8 mg/L

Human Health and Agriculture

Calculate MDL & AML

MDL	AML
$MDL=AML*\frac{\exp[z_m\sigma-0.5\sigma^2]}{\exp[z_a\sigma_n-0.5\sigma_n^2]}$	$AML = WLA$
$\sigma^2=\ln[CV^2+1]$	
$\sigma_n^2=\ln[(CV^2/n)+1]$	
$n = \text{\# samples required per month}$	
$z_m=2.326 \text{ for 99th percentile occurrence probability}$	
$z_a=1.645 \text{ for 95th percentile occurrence probability}$	

Table 5-3. Multipliers for Calculating Maximum Daily Permit Limits From Average Monthly Permit Limits

To obtain the maximum daily permit limit (MDL) for a bioconcentratable pollutant, multiply the average monthly permit limit (AML) (the wasteload allocation) by the appropriate value in the following table.

Each value in the table is the ratio of the MDL to the AML as calculated by the following relationship derived from Step 4 of the statistically based permit limit calculation procedure.

$$\frac{MDL}{AML} = \frac{\exp [z_m \sigma - 0.5 \sigma^2]}{\exp [z_a \sigma_n - 0.5 \sigma_n^2]}$$

where

$$\sigma_n^2 = \ln (CV^2/n + 1)$$

$$\sigma^2 = \ln (CV^2 + 1)$$

CV = the coefficient of variation of the effluent concentration

n = the number of samples per month

z_m = the percentile exceedance probability for the MDL

z_a = the percentile exceedance probability for the AML.

CV	Ratio Between Maximum Daily and Average Monthly Permit Limits									
	Maximum = 99th percentile Average = 95th percentile					Maximum = 99th percentile Average = 99th percentile				
	n=1	n=2	n=4	n=8	n=30	n=1	n=2	n=4	n=8	n=30
0.1	1.07	1.13	1.16	1.18	1.22	1.00	1.07	1.12	1.16	1.20
0.2	1.14	1.25	1.33	1.39	1.46	1.00	1.13	1.24	1.32	1.43
0.3	1.22	1.37	1.50	1.60	1.74	1.00	1.19	1.36	1.49	1.67
0.4	1.30	1.50	1.67	1.82	2.02	1.00	1.24	1.46	1.66	1.92
0.5	1.38	1.622	1.84	2.04	2.32	1.00	1.28	1.56	1.81	2.18
0.6	1.46	1.73	2.01	2.25	2.62	1.00	1.31	1.64	1.95	2.43
0.7	1.54	1.84	2.16	2.45	2.91	1.00	1.34	1.71	2.08	2.67
0.8	1.61	1.94	2.29	2.64	3.19	1.00	1.35	1.76	2.19	2.89
0.9	1.69	2.03	2.41	2.81	3.45	1.00	1.36	1.80	2.27	3.09
1.0	1.76	2.11	2.52	2.96	3.70	1.00	1.37	1.83	2.34	3.27
1.1	1.83	2.18	2.62	3.09	3.93	1.00	1.37	1.84	2.39	3.43
1.2	1.90	2.25	2.70	3.20	4.13	1.00	1.36	1.85	2.43	3.56
1.3	1.97	2.31	2.77	3.30	4.31	1.00	1.36	1.85	2.45	3.68
1.4	2.03	2.37	2.83	3.39	4.47	1.00	1.35	1.84	2.46	3.77
1.5	2.09	2.42	2.89	3.46	4.62	1.00	1.34	1.83	2.46	3.84
1.6	2.15	2.42	2.89	3.46	4.62	1.00	1.33	1.82	2.46	3.90
1.7	2.21	2.52	2.98	3.57	4.85	1.00	1.32	1.80	2.45	3.94
1.8	2.27	2.56	3.01	3.61	4.94	1.00	1.31	1.78	2.43	3.97
1.9	2.32	2.60	3.05	3.65	5.02	1.00	1.30	1.76	2.41	3.99
2.0	2.37	2.64	3.07	3.67	5.09	1.00	1.29	1.74	2.38	4.00

Whole Effluent Toxicity (WET)

- ◆ Goals
- ◆ Concerns
- ◆ Implementation policy
- ◆ WET test methods
 - Acute
 - Chronic
- ◆ Statistical approach
- ◆ TRE

WET Goals

- ◆ Protect narrative standard
- ◆ Aggregate toxic effect
 - complex effluents
 - supplement chemical-specific limits
 - ambient testing

WET allows for the protection of the narrative standard “no toxics in toxic amounts”.

The WET approach is useful for complex effluents where it may be infeasible to identify and regulate all toxic pollutants in the discharge or where chemical specific pollutant limits are set, but synergistic effects are suspected to be problematic.

WET testing can be conducted in the receiving water to determine if toxicity is occurring in the ambient, since ambient conditions may be different from effluent conditions.

Concerns of WET Testing

- ◆ QA/QC
- ◆ Quality of labs
- ◆ Training
- ◆ Interpretation of results

Implementation Policy

- ◆ Narrative - “no toxics in toxic amounts”
- ◆ Numeric
 - mixing zone allowed
 - » Acute = 0.3 TU_a
 - » Chronic = 1.0 TU_c
 - no mixing zone
 - » Acute = 1.0 TU_a

WET testing is the mechanism used for implementing the narrative standard of “no toxics in toxic amounts. The TSD recommends numeric criteria for toxicity when a state has a narrative standard.

Toxicity is expressed in terms of “toxic units” (TU). A TU is the inverse of the sample fraction (1/fraction). Since toxicity is usually expressed as percent sample, the inverse could be expressed in terms of 100 toxic units (100/percent).

Example: chronic test with NOEC=25%

$$\text{TU}_c = 1/0.25 = 4.0$$

or

$$\text{TU}_c = 100/25 = 4.0$$

WET Requirements in Permits

- ◆ Test species and method
- ◆ Testing frequency
- ◆ Statistical endpoints
- ◆ Steps to address toxicity

WET Test Methods	
Acute	Chronic
<ul style="list-style-type: none"> ◆ Test duration <ul style="list-style-type: none"> – <96 hours ◆ Endpoint <ul style="list-style-type: none"> – Quantal (mortality) – LC50 – pass/fail 	<ul style="list-style-type: none"> ◆ Test duration <ul style="list-style-type: none"> – 1.5 hours to 9 days (depending on species) ◆ Endpoint <ul style="list-style-type: none"> – NonQuantal (growth, reproduction, etc.) – NOEC – LOEC – IC – EC

There are two types of WET tests: acute and chronic.

An acute toxicity test is usually conducted over a short time period and the endpoint measured is mortality. The endpoint for an acute test is often expressed as an LC50.

- LC50 is the concentration of effluent that is lethal to 50 percent of the exposed test organisms.
- A pass/fail test is a screening test and should not be used in lieu of statistical tests with dilution series. A pass/fail test is a statistical evaluation of toxicity using student t-test to compare mortality rates of an ambient sample or instream waste concentration (IWC) sample against a control.

A chronic toxicity test is usually conducted over a longer period of time and the endpoint measured is mortality and sublethal effects, such as changes in reproduction and growth. The endpoint is often expressed as the no observed effect concentration (NOEC), the lowest observed effect concentration (LOEC), the inhibition concentration (IC), or the effect concentration (EC).

NOEC is the highest concentration of effluent at which no adverse effects are observed on the aquatic test organisms.

- LOEC is the lowest concentration of effluent that causes observable adverse effects in exposed test organisms.

- IC is an estimate of the effluent concentration that would cause a given percent reduction in a nonlethal biological measurement of the test organisms. (IC25 is the concentration of effluent that would cause 25% reduction in reproduction.)

- EC is an estimate of the effluent concentration that would cause an observable adverse effect in a given percentage of the test organisms. (EC10 is the concentration of effluent that would cause 10% mortality to test organisms.)

Statistical Approach

- ◆ Hypothesis testing
 - LOEC
 - NOEC
- ◆ Point estimate techniques
 - LC50
 - EC_p
 - IC_p
- ◆ Acute to chronic ratio (ACR)

The lower the effluent concentration, the higher the toxic effect.

Hypothesis testing

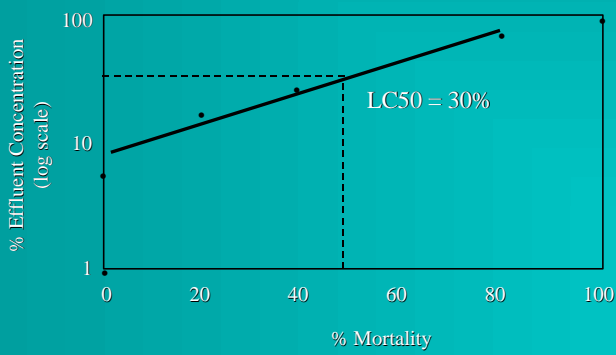
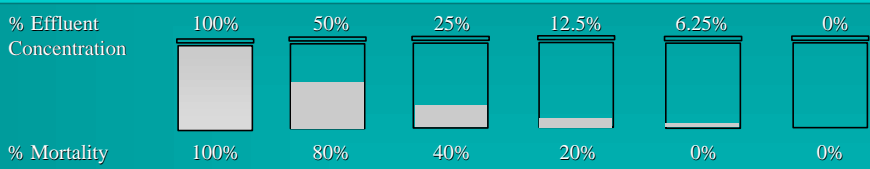
- NOEC is a lower concentration level than LOEC
- NOEC may represent a different amount from test to test
- Cannot calculate CV or confidence intervals

Point estimates

- Need to specify biological effect - what value of “p” to use
- Always estimating same effect
- Can calculate CV and confidence intervals

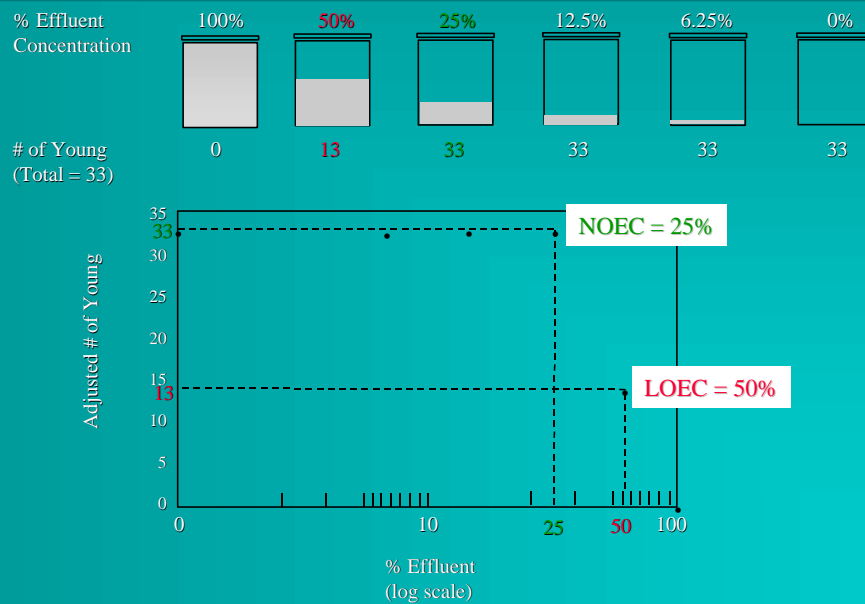
Acute Test

Example of LC50 Analysis



Chronic Test

Hypothesis: NOEC & LOEC



Start at 0% effluent concentration

the last concentration where there is no effect (# young = total) is NOEC

the NOEC occurs at 25% effluent

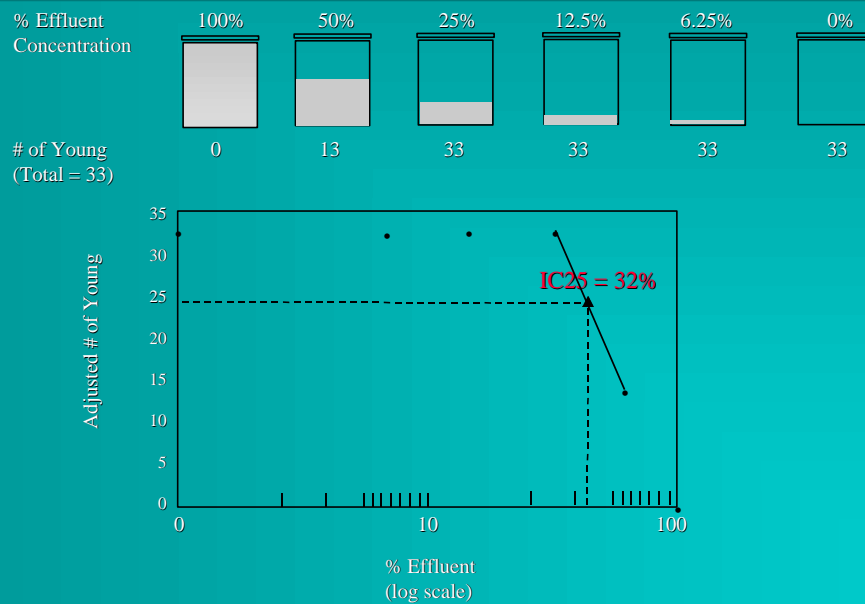
the next concentration (at 50% effluent concentration) gives an observable effect since there are only 13 young in lieu of 33 young.

this is the LOEC

the LOEC occurs at 50% effluent

Chronic Test

Example of IC25 Analysis



IC25 is 25% reduction in reproduction

$100\% - 25\% = 75\%$

75% of 33 (total young) = 24 (round down because you can't have part of one)

@24 young, effluent concentration is 32%
(linear extrapolation between LOEC & NOEC)

Acute to Chronic Ratio (ACR)

- ◆ Estimate acute toxicity from chronic tests
- ◆ Estimate chronic toxicity from acute tests

$$\text{ACR} = \frac{\text{Acute Endpoint}}{\text{Chronic Endpoint}} = \frac{\text{LC50}}{\text{NOEC}} = \frac{\text{TUc}}{\text{TUa}}$$

Since TUa and TUc are different units, it is important to develop a conversion factor that relates one to the other. This conversion factor is called an acute to chronic ratio (ACR). If data are insufficient to calculate an ACR (i.e., less than 10 sets of WET data), EPA recommends a default value of ACR=10. Where sufficient data are available, the ACR should be calculated as the mean of the individual ACRs for each pair of acute and chronic WET test data.

Toxicity Reduction Evaluation (TRE)

◆ Site-specific study

- identify cause
- isolate source
- evaluate control options
- confirm toxicity reduction

◆ Mechanisms

- permit
- section 308 letter
- section 309 administrative order
- consent decree

A TRE is procedures for investigating the causes and identifying corrective actions for effluent toxicity problems. TRE's are necessary to achieve compliance with limits or requirements for effluent toxicity contained in NPDES permits.

A TRE is a site-specific study designed to:

- identify the causative agents of effluent toxicity
- isolate the sources of the toxicity
- evaluate the effectiveness of toxicity control options
- confirm the reduction in effluent toxicity

A TRE can be implemented in several ways.

- special conditions in a NPDES permit (trigger limits)

Objectives of Workshop



- ✓ Overview of statutes & regulations
- ✓ Permit process
- ✓ Types of effluent limits
 - Other permit conditions
 - Other permitting considerations
 - Administrative process
 - Compliance & enforcement

Other Permit Conditions

- ◆ Monitoring, recording & reporting
- ◆ Special conditions
- ◆ Standard conditions

Monitoring Conditions

- ◆ Purpose
- ◆ Types
- ◆ Location
- ◆ Frequency
- ◆ Sample collection
- ◆ Analytical methods
- ◆ Cost

Purpose of Monitoring

- ◆ Permit compliance
- ◆ Basis for enforcement actions
- ◆ Assess treatment efficiency
- ◆ Characterize effluents
- ◆ Characterize receiving water

Types of Monitoring

- ◆ Self-monitoring
- ◆ Compliance Monitoring

- Permittee performs sampling and analysis
- Permitting authority (EPA) monitors effluent during compliance inspection

Monitoring Location

- ◆ Measurable
- ◆ Accessible
- ◆ Representative
- ◆ Internal monitoring

The NPDES regulations do not specify the exact location to be used for monitoring. The permit writer is responsible for determining the most appropriate monitoring location and explicitly specifying this in the permit. Specifying the monitoring location in a NPDES permit is critical to producing valid compliance data. Important factors to consider in selecting a monitoring location include:

- The wastewater flow should be measurable
- The monitoring location should be easily and safely accessible. (Is the monitoring location on the facility's property?)
- The sample must be representative of the effluent during the time period that is monitored.
- Are internal monitoring points needed? When a facility combines a variety of process and non-process waste waters prior to discharge through a common outfall structure, internal monitoring may be required.

Monitoring Frequency

- ◆ Effluent variability
- ◆ Facility size and design
- ◆ Type of treatment
- ◆ Location of discharge
- ◆ Frequency of discharge
- ◆ Compliance history
- ◆ Nature of pollutants
- ◆ Number of samples
- ◆ Tiered limits

The frequency for monitoring pollutants should be determined on a case-by-case basis, and decisions for setting the frequency should be set forth in the fact sheet. The intent is to establish a frequency of monitoring that will detect most events of noncompliance without requiring needless or burdensome monitoring.

- To establish a monitoring frequency, the variability of the concentration of the parameter should be estimated by reviewing effluent data for the facility or in the absence of actual data, information from similar dischargers. A highly variable discharge should require more frequent monitoring than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentration).
- If the treatment method is appropriate and achieving high pollutant removals on a consistent basis, the need for monitoring may be less than a plant with little treatment or insufficient treatment.
- If a monitoring is difficult to access, then less monitoring should be required than if the location were easily accessible.
- If wastewater is discharged in batches on an infrequent basis, the monitoring frequency should be different from a continuously discharged, highly concentrated wastewater containing a pollutant that is found infrequently and at very low concentrations. The production schedule of the facility and the plant washdown schedule should be considered.
- A facility with problems achieving compliance generally should be required to perform additional monitoring to characterize the source or cause of the problems or to detect noncompliance.
- Carcinogens, toxics, conventionals, nonconventionals, etc.
- The monitoring frequency should reflect the number of monthly samples used in developing the permit limits, and/or the monitoring frequencies used to develop any applicable effluent guidelines.
- Consideration should be given to varying the monitoring frequency requirements to correspond to the applicable tiers. (e.g., seasonal limits - increase monitoring during high production seasons and decrease during off-seasons)

Sample Collection

- ◆ Grab
- ◆ Composite
 - time proportional
 - flow proportional
- ◆ Continuous

•A grab sample is a single sample collected at a particular time and place that represents the composition of the wastestream only at that place and time. Grab samples should be used when:

- the parameters to be analyzed are likely to change with storage (e.g., temperature, chlorine, soluble sulfide, cyanides, phenols, pH, etc.)
- the parameters to be analyzed are likely to be affected by the compositing process (e.g., oil & grease).
- The effluent flow is intermittent or batch discharged

•A composite sample is a collection of individual samples obtained at regular intervals. A composite sample is desirable when the material being sampled varies significantly over time either as a result of flow or quality changes.

- Time composite samples collect a fixed volume at equal time intervals and are acceptable when flow variability is not excessive. Automatically timed composited samples are usually preferred over manually collected composites except when flow variability is not excessive. (static flow)
- Flow-proportional compositing is usually preferred when effluent flow volume varies appreciably over time. Constant volume, variable time sampling should be done when the flow varies throughout the day. Constant time, variable volume sampling should be done when the volume of sample is proportional to flow of effluent (e.g., stormwater)

•A continuous sample is an automated collection of samples. Continuous monitoring can be used for flow, temperature, pH, fluoride, and DO. Continuous monitoring can be expensive and should only be required for significant dischargers with variable effluent. The reliability, accuracy, and cost vary with the parameter.

Analytical Methods

◆ 40 CFR Part 136

- Test Methods in Appendix A to Part 136
- Standard Methods for the Analysis of Water & Wastewater
- Methods for the Chemical Analysis of Water and Wastes
- Test Methods: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater

◆ Alternative methods

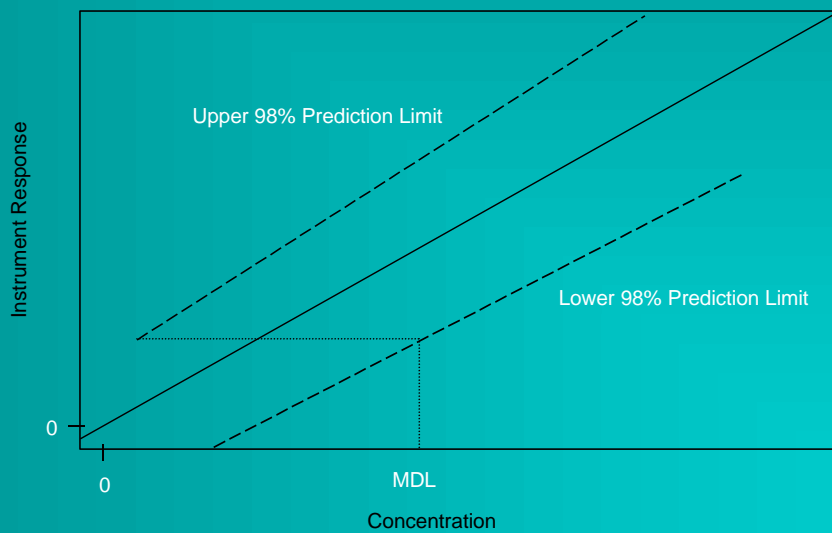
When limits fall below method detection levels (MDLs), EPA's policy is to use the MDL as the compliance level. In essence, this is saying that "if the parameter is not detected using EPA approved methods, then the permittee is in compliance with the permit limits."

EPA allows the use of alternative test procedures at the request of the permittee or laboratory providing the analysis. The alternative test procedure must be approved by EPA prior to use for compliance monitoring.



- There are several sources of variability in a detection limit. Some are listed on this slide.
- Any instrument used to measure chemical concentrations displays bias and variability.

Method Detection Limit



The instrument detection limit (IDL) depends on:

- the chemical being analyzed
- the type of instrument being used
- the lab technician
- the laboratory protocols
- etc.

As the number of sources increases, the error bands get wider.



Cost

Estimated Costs for Common Analytical Procedures (Based on 1994-1995 Costs)

BOD	\$30
TSS	\$15
Oil & Grease	\$35
Turbidity	\$30
Metals (each)	\$15
Cyanide	\$35
Acute WET	\$750
Chronic WET	\$1,500

Even though it is not required to evaluate costs, as a practical matter cost should be considered for the sampling required by the permittee.

Reporting Results

- ◆ Discharge Monitoring Report (DMR)
- ◆ Data
- ◆ Reports
- ◆ Frequency

- The permittee is required to report self-monitoring discharge information to the permitting authority (EPA) using the DMR (EPA Form 3320-1).
- Data reported include both data required by the permit and any additional data the permittee has collected consistent with permit requirements.
- Any special studies or reports that are required by the permit to be submitted with the DMR.
- The regulations (40 CFR 122.44(I)(2)) require that reports are submitted at least annually, but most facilities are required to submit them on a monthly basis.

FACILITY	LOCATION
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
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12	12
13	13
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99	99
100	100

MONITORING PERIOD							
YEAR		MO		DAY		TO	
(20-21)	(22-23)	(24-25)				(26-27)	(28-29) (30-31)

NOTE: Read instructions before completing this form.

[illegible]

Record Keeping

- ◆ Retention time
 - 3 years
 - 5 years for sewage sludge
- ◆ Monitoring records
- ◆ Location

•Records must be kept by the permittee for at least 3 years and this time may be extended by the Director upon request. Records for sewage sludge use and disposal activities must be kept for 5 years.

•Monitoring records include:

- Date, place, time monitoring occurred
- Name of sampler (individual performing sampling)
- Date of analysis
- Analytical methods used
- Analytical results
- Continuous strip chart recordings
- Calibration data
- Required reports & data used to compile reports

•The permit should specify where the records should be located.

Special Conditions

- ◆ Special studies
- ◆ Best Management Practices (BMPs)
- ◆ Pollution Prevention
- ◆ Compliance Schedules

Special conditions are used in NPDES permit to:

- address unique situations and provide additional information
- incorporate preventative requirements, such as requirements to install process control alarms, containment structures, good housekeeping practices
- incorporate compliance schedules to provide the time necessary to comply with permit conditions
- incorporate other requirements (sewage sludge, pretreatment, CSO, stormwater)

Special Studies

- ◆ Treatability studies
- ◆ Toxicity identification evaluation/Toxicity reduction evaluation (TIE/TRE)
- ◆ Mixing or mixing zone studies
- ◆ Sediment monitoring
- ◆ Bioconcentration studies

- Applicable when treatability information is lacking for a pollutant or pollutants that would prohibit a permit writer from developing defensible technology-based effluent limits. Treatability studies can also be required when the permit writer suspects that a facility may not be able to comply with an effluent limit.

- Required for facilities for which wastewater discharges are found to be toxic as a result of a WET test. The purpose of these evaluations is to identify and control the sources of toxicity in an effluent.

- Used to assist in determining the allowable ambient mixing that can be applied when developing WQBELs.

- Used if a permit writer suspects that pollutants contained in wastewater discharges accumulate in the sediments of the receiving water.

- Used to determine whether pollutants contained in wastewater discharges bioaccumulate in aquatic organisms (e.g., fish, invertebrates). These types of studies are usually recommended when WQBELs for pollutants that bioaccumulate are established below analytical detection levels.

Best Management Practices (BMPs)

- ◆ Measures
- ◆ BMP plan
 - minimum requirements
 - recommended components
- ◆ Specific BMPs
 - qualitative
 - procedural

BMPs are measures to prevent or minimize water pollution from sources ancillary to the industrial manufacturing or treatment process.

- Measures are actions or procedures.
- It is the responsibility of the permittee to plan, develop and implement, and reevaluate the successes/shortfalls of its own plan. Plant management has overall responsibility and accountability for the quality of the BMP plan.
- Specific BMPs are most effectively used in conjunction with effluent limits in the permit. Specific BMPs are designed to address conditions particular to a site, process or pollutant.

BMP Measures

- ◆ Schedule of activities
- ◆ Prohibitions of practices
- ◆ Maintenance procedures
- ◆ Treatment options
- ◆ Operating procedures & practices to:
 - control plant site runoff
 - spillage or leaks
 - sludge or waste disposal
 - drainage from raw material storage areas

BMP Plan

◆ Minimum requirements

- facility name and location
- statement of BMP policy & objectives
- review by plant manager

◆ Specific requirements

- BMP committee
- risk identification and assessment
- reporting of BMP incidents
- materials compatibility
- good housekeeping
- preventive maintenance
- inspections and records
- security
- employee training

Specific BMPs

- ◆ Qualitative
- ◆ Procedural
 - visual inspections
 - training
 - maintain maintenance logs
 - material handling procedures
 - preventative maintenance
 - housekeeping

- Specific BMPs should indicate how or what and should not
 - substitute for quantitative controls
 - tell managers how to run their plants
 - require costly methods when inexpensive ones will suffice

Examples of BMPs

- ◆ Water conservation/non-use
- ◆ Secondary containment
- ◆ Nondestructive testing
- ◆ Materials engineering
- ◆ Covering
- ◆ Sealing
- ◆ Packaging
- ◆ Waste stream segregation
- ◆ Source elimination
- ◆ Alarm systems
- ◆ Diverting
- ◆ Paving
- ◆ Runoff control
- ◆ Sludge management
- ◆ Monitoring
- ◆ Security

Pollution Prevention

◆ Hierarchy

- source reduction
- environmentally sound reuse & recycle
- treatment
- disposal

◆ Implemented through BMPs

Pollution prevention has been shown to reduce costs as well as pollution risks through source reduction and recycling/reuse techniques.

•Under Section 6602(b) of the Pollution Prevention Act of 1990, Congress established a national policy for a hierarchy of environmental management. This hierarchy should be viewed as establishing a set of preferences, rather than an absolute judgement that prevention is always the most desirable option. The hierarchy is applied to many different circumstances that require good judgement.

- Pollution should be prevented or reduced at the source, whenever feasible
- Pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

•BMPs are inherently pollution prevention practices. Traditionally, BMPs have focused on good housekeeping measures and good management techniques that attempt to avoid contact between pollutants and water media as a result of leaks, spills, and improper waste disposal. However, BMPs may include the universe of pollution prevention which encompasses production modifications, operational changes, material substitution, materials and water conservation, and other such measures.

Compliance Schedules

- ◆ Programs
 - Pretreatment
 - Sewage sludge
 - CSO
 - Stormwater
- ◆ New discharger/New source
- ◆ New/revised water quality standards
- ◆ Special permit conditions
 - BMP plan
 - QAPP plan

Compliance schedules allow permittees additional time to achieve compliance with the CWA and applicable regulations. Compliance schedules that exceed one year must have annual interim dates with milestones that the permittee reports status to the permitting authority.

Compliance schedules allow implementation of certain programs such as:

- Pretreatment program
- Sludge use & disposal program
- CSO control program
- Stormwater

Compliance with technology-based effluent limits is only allowed for new discharger/new source (90-days)

Compliance with WQBELs is only allowed when a state allows it. Idaho has an allowance for compliance schedules for newly imposed WQBELs.

WQBELs imposed from WQS promulgated after 1977 are also allowed a compliance schedule.

Compliance with new conditions in the permit, such as:

- BMP plan development/implementation
- QAPP plan development/implementation

Standard Conditions

- ◆ Requirements

- verbatim
- by reference

- ◆ Types

- ◆ Other

The use of standard conditions helps ensure uniformity and consistency of all NPDES permits issued by the permitting authority (EPA). The standard conditions set out in 40 CFR 122.41 and 122.42 play an important supporting role to the numeric permit limits because these conditions delineate the legal, administrative, and procedural requirements of the permit. Standard conditions cover various topics, including definitions, testing procedures, records retention, notification requirements, penalties for noncompliance, and permittee responsibilities.

- Standard conditions may be inserted verbatim from the regulations or incorporated into the permit by specific reference to the regulations.

Types of Standard Conditions

- ◆ Duty to Comply
- ◆ Duty to Reapply
- ◆ Need to Halt or Reduce Activity not a Defense
- ◆ Duty to Mitigate

- The permittee must comply with all conditions of the permit. Noncompliance is a violation of the CWA and is grounds for injunctive relief, substantial monetary penalties, incarceration, changes or terminations to the permit, or denial of permit renewal.
- If a permittee, after the expiration of its permit, desires to continue its activities, it must reapply for and obtain a new permit.
- The permittee may not use as a defense the reasoning that compliance could only be achieved by halting or reducing the permitted activity.
- The permittee is required to take all reasonable steps to prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

Types of Standard Conditions (cont.)

- ◆ Proper O&M
- ◆ Permit Actions
- ◆ Property Rights
- ◆ Duty to Provide Information

- The permittee must properly operate and maintain all equipment and treatment systems used by the permittee for compliance with the terms of the permit. The permittee must provide appropriate laboratory controls and quality assurance procedures. Backup systems are required when needed to ensure compliance. However, each main line unit treatment process must be operated as a minimum.
- The permit may be modified, revoked, reissued, or terminated for cause. The filing of a request by the permittee for a modification, revocation, reissuance, termination, or notification of planned changes or anticipated noncompliance does not halt any permit condition.
- The permit does not convey any property rights of any sort, or any exclusive privilege.
- The permittee must transmit any information needed to determine compliance with the permit or to modify the permit.

Types of Standard Conditions (cont.)

- ◆ Inspection & Entry
- ◆ Monitoring & Records
- ◆ Signatory & Certification Requirements
- ◆ Planned Changes

•The permittee must, upon presentation of valid credentials by the Director or his representative, allow entry into the premises where the regulated activity and/or records are present. The Director must have access to and be able to make copies of any required records, inspect facilities, practices, operations, and equipment, and sample or monitor at reasonable time.

•Samples must be representative of the monitored activity. Records must be retained for 3 years (5 years for sludge activities) subject to extension by the Director. Monitoring records must identify the sampling dates and personnel, the sample location and time, and the analytical techniques used and corresponding results. Wastewater and sludge measurements must be conducted in accordance with 40 CFR Parts 136, 503 or other specified procedures. Falsification of results is a violation.

•Applications, reports, or information submitted to the Director must be signed and certified. Knowingly making false statements, representations, or certifications is subject to penalties.

•Notice must be given to the Director as soon as possible of any planned physical alterations and/or additions to the facility. This notice is required if the facility changes to meet the criteria for a new source or the nature and concentration of pollutants are affected.

Types of Standard Conditions (cont.)

- ◆ Anticipated Noncompliance
- ◆ Permit Transfers
- ◆ Monitoring Reports
- ◆ Compliance Schedules

- The permittee must give advance notice of any conditions that may result in noncompliance.
- The permit is not transferable except after written notice to the Director. The Director may require modification or revocation and reissuance, as necessary.
- Reports must be submitted on a DMR or on a Director-specified form for sludge use/disposal practices. In addition, more frequent monitoring must be reported. Calculations requiring averaging must use an arithmetic mean, except for fecal coliform. Monitoring results must be reported at the frequency specified in the permit.
- Reports required by a compliance schedule in the permit must be submitted within 14 days of the due date.

Types of Standard Conditions (cont.)

- ◆ 24-hour Reporting
- ◆ Other Noncompliance
- ◆ Other Information

- The permittee must report any noncompliance that may endanger human health or the environment within 25 hours after becoming aware of the circumstance. Within 5 days, the permittee must provide a written submission containing the information outlined in 40 CFR 122.41(l)(6)(ii) unless the requirement is waived by the permitting authority.
- The permittee must report all instances of noncompliance not reported under other specific reporting requirements at the time monitoring reports are submitted.
- Where the permittee becomes aware that it failed to submit any relevant facts in its application, or submitted incorrect information in its application or other reports, it must promptly submit such information.

Other Standard Conditions

- ◆ Notification levels for Industry
- ◆ Notification levels for POTWs
- ◆ Annual report for MS4

In addition to standard conditions specified in 40 CFR 122.41, 40 CFR 122.42 sets forth additional conditions applicable to specified categories of NPDES permits. These conditions include:

- Existing manufacturing, commercial, mining, and silvicultural dischargers must notify EPA as soon as they know or have reason to believe that the discharge has or will exceed notification levels set forth in 40 CFR 122.42(a).
- POTWs must provide adequate notice to EPA for new introduction of pollutants into the POTW, for substantial changes in the volume or character of pollutants, and related information specified in 40 CFR 122.42(b).
- Large, medium or EPA-designated municipal separate storm sewer systems (MS4s) must submit an annual report addressing the status, and changes to, the storm water management program, water quality data and other information specified in 40 CFR 122.42(c).

Objectives of Workshop



- ✓ Overview of statutes & regulations
- ✓ Permit process
- ✓ Types of effluent limits
- ✓ Other permit conditions
- Other permitting considerations
- Administrative process
- Compliance & enforcement

Other Permitting Considerations

- ◆ Variances
 - technology-based
 - water quality-based
- ◆ Anti-backsliding
- ◆ Other federal laws

Variances to Technology-Based Permit Requirements

- ◆ Economic
- ◆ Localized environmental factors
- ◆ Marine discharge
- ◆ Fundamentally different factors
- ◆ Thermal discharge
- ◆ Net credits

The CWA provides a mechanism for modification (or variances) of the technology-based requirements for exceptional cases. Very specific data requirements must be met by an applicant before a variance may be granted (See 40 CFR 124.62). A technology-based variance must be received before the end of the public comment period, except for fundamentally different factors.

- Section 301(c) of the CWA provides for a variance for nonconventional pollutants from BAT-based effluent limitations due to economic factors.
- Section 301(g) of the CWA provides for a variance for certain nonconventional pollutants from BAT effluent guidelines due to localized environmental factors. These pollutants include ammonia, chlorine, color, iron, and total phenols.
- Section 301(h) of the CWA provides for variances from secondary treatment standards for POTWs that discharge into marine waters if the modified requirements do not interfere with the attainment or maintenance of water quality.
- Section 301(n) of the CWA provides for variances based upon fundamentally different factors (FDF) for BAT and BCT pollutants while 40 CFR Part 125, Subpart D provides the regulatory authority for BPT variances.
- Section 316(a) of the CWA provides for variances from effluent limitations for the thermal component of a discharge.
- NPDES regulations allow credit for pollutants in intake water under certain circumstances sited in 40 CFR 122.45(g).

Variances to Water Quality-Based Permit Requirements

- ◆ Site-specific water quality criteria
- ◆ Designated use reclassification
- ◆ Water quality standard

•The State has the option of modifying water quality criteria on a site-specific basis. Setting site-specific criteria may be appropriate where background water quality parameters (pH, hardness, temperature) appear to be different than those used to develop the CWA 304(a) criteria or the types of local aquatic organisms differ significantly from those tested during the development of the CWA 304(a) criteria. These “modifications” permanently change water quality criteria, but not the designated uses, and requires promulgation of state law, EPA approval, and ESA consultation.

•The State can only reclassify a water body segment’s use under certain conditions specified in Section 101(a)(2) of the CWA. This involves a use attainability analysis pursuant to 40 CFR 131.10(j) and is discussed further in *The Water Quality Standards Handbook: Second Edition*, USEPA, 1994. EPA 823-B-94-005a. Office of Water. Reclassifying a waterbody permanently changes the water quality standard for that waterbody and required promulgation of state law, EPA approval, and ESA consultation.

•Standard variances are specific to the discharger and the pollutant types, are time-limited (3-years), and do not forego the currently designated use of a waterbody. This type of variance is appropriate where the state believes that the standard can be ultimately attained. The state must demonstrate that meeting the standard is unattainable based on one or more of the grounds outlined in 40 CFR 131.10(g).

Anti-Backsliding

- ◆ Prohibit relaxation of effluent limits
 - BPJ to less stringent ELG
 - state treatment standard or WQS
 - ELG
 - antidegradation

The term “anti-backsliding” refers to a statutory provision [section 402(o) of the CWA] that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit.

- Effluent limits cannot be relaxed when a permittee seeks to revise a technology-based effluent limitation based on best professional judgement to reflect a subsequently promulgated effluent guideline which is less stringent.
- Effluent limits cannot be relaxed for an effluent limitation which is based upon a state treatment standard or water quality standard.
- Effluent limits cannot be relaxed if a revised effluent limitation would result in a violation of applicable effluent limitation guidelines or water quality standards, including antidegradation requirements.

Anti-Backsliding

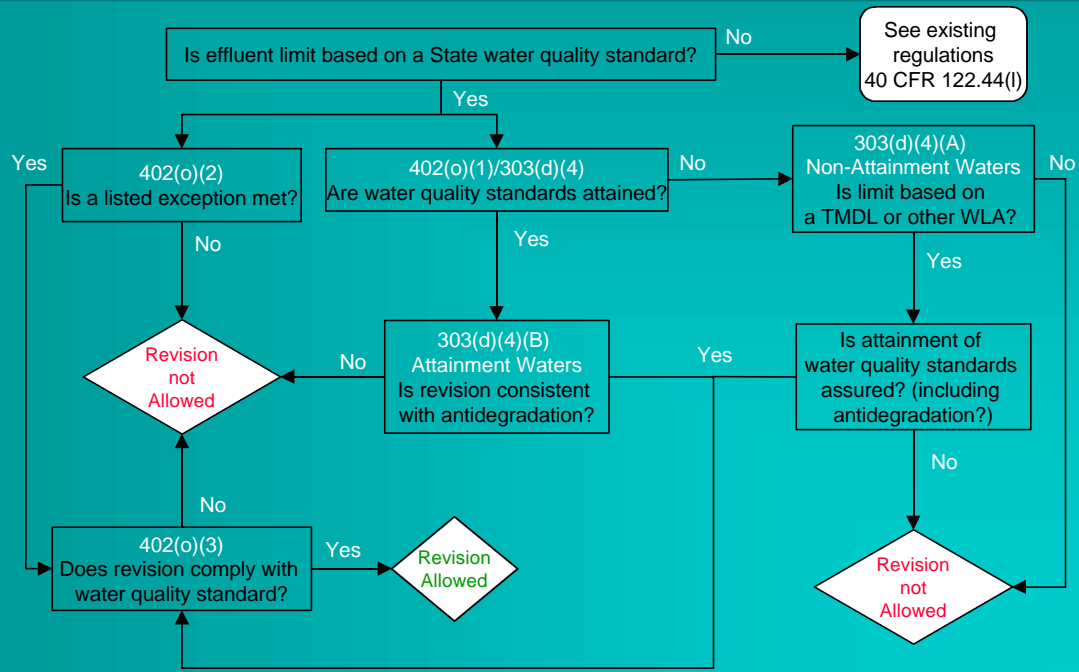
◆ Exceptions

- facility alternations or additions
- new information
- technical mistakes
- good cause exists
- permit mod or variance granted
- treatment levels

• There are some exceptions that are allowed by Section 402(o)(2) and codified in the NPDES regulations at 40 CFR 122.44(l). These exceptions are:

- There have been material and substantial alternations or additions to the permitted facility which justify this relaxation.
- New information (other than revised regulations, guidance, or test methods) is available that was not available at the time of permit issuance which would have justified a less stringent effluent limitation.
- Technical mistakes or mistaken interpretations of the law were made in issuing the permit under Section 402(a)(1)(b).
- Good cause exists due to events beyond the permittee's control (e.g., acts of God) and for which there is no reasonably available remedy.
- The permit has been modified under 40 CFR 122.62, or a variance has been granted.
- The permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the permit limitations (relaxation may only be allowed to the treatment levels actually achieved).

Anti-Backsliding Flow Chart



Other Federal Laws

- ◆ National Historic Preservation Act
- ◆ Endangered Species Act
- ◆ Wild and Scenic Rivers Act
- ◆ Coastal Zone Management Act
- ◆ Fish and Wildlife Coordination Act
- ◆ National Environmental Policy Act

Most of these laws (NHPA, ESA, FWCA, and NEPA) only apply when EPA is the permitting authority.

- NHPA Amendments of 1992 - Must take into account the effect of proposed Federal or Federally assisted undertakings on architectural, archeological, historic, or cultural resources listed, or eligible for listing, on the National Register of Historic Places.
- ESA of 1973 - Section 7 of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out by a Federal agency not jeopardize the continued existence of a listed or candidate species or result in the destruction or adverse modification of its habitat. The ESA regulations require that consultation with the NMFS and/or the FWS, as appropriate, occur when the Federal activity is one which may effect an endangered and/or threatened species or habitat. Consultations may be either informal (not likely to adversely effect) or formal (likely to adversely affect)
- WSRA of 1968 - Protects rivers from construction of dams and excessive commercial development.
- CZMA of 1972 - EPA and other Federal agencies must coordinate their activities on coastal lands with State CZMA plans (land-use plans for the lands and water adjacent to their coasts).
- FWCA of 1934 - Requires mitigation for the loss of wildlife habitat due to the construction of Federal water resources projects (Federal dams, reservoirs, and irrigation works).
- NEPA of 1967 - Requirements apply to NPDES permits issued by EPA to new sources in non-delegated states. EPA must file and EIS or EA.

Objectives of Workshop



- ✓ Overview of statutes & regulations
- ✓ Permit process
- ✓ Types of effluent limits
- ✓ Other permit conditions
- ✓ Other permitting considerations
- Administrative process
- Compliance & enforcement

Administrative Process

- ◆ Documentation for draft permit
- ◆ Public participation activities
- ◆ Documentation for permit issuance
- ◆ Administrative Actions

The administrative record is the foundation for issuing permits. All documents in the administrative record are available to the public. In general, the administrative process includes:

- Documenting all permit decisions
- Coordinating EPA and state review of the permit
- Providing public notice, conducting hearings (if appropriate), and responding to comments
- Defending the permit and modifying it (if necessary) after issuance.

Documentation for Draft Permit

- ◆ Application and supporting data
- ◆ Draft permit
- ◆ Fact sheet/Statement of basis
- ◆ All cited documents
- ◆ All other supporting documentation
- ◆ New source documents (if applicable)

- A fact sheet is a document that briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. When the permit is in the draft stage, the fact sheet and supporting documentation serve to explain to the permittee and the general public the rationale and assumptions used in deriving the limits.

- Materials that are readily available in the permitting office or published material that is generally available does not need to be physically included in the record as long as it is specifically referred to in the fact sheet (or statement of basis).

- The administrative record should include all meeting reports and correspondence with the applicant and correspondence with other regulatory agency personnel. In addition, trip reports and telephone memos should be included in the record. All correspondence, notes, and calculations should indicate the date and the name of the writer, as well as all other persons involved.

- Any new source documents (e.g., EA, EIS, FONSI, etc.) should be included in the administrative record.

Public Participation Activities

- ◆ Public notice
- ◆ Public hearing
- ◆ Workshops

Public participation activities that must be conducted in the permit issuance process include providing public notices, collecting and responding to public comments, and holding public hearings if necessary.

Workshops are public participation activities that are not required in the permit issuance process.

Public Notice

- ◆ Purpose
- ◆ Methods
 - publication in newspaper
 - publication in FR (GPs only)
 - direct mailing
- ◆ Timing
 - after EPA/state review
 - at least 30 days

•The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or of other significant actions with respect to a NPDES permit or permit application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or a permit. The exact scope, required contents, and methods for effecting public notices may be found in 40 CFR 124.10.

•Public notice of the various NPDES-related activities is provided by the following methods:

- For major permits, publication of a notice in daily or weekly newspaper within the area affected by the facility or activity.
- For general permits, publication in the Federal Register.
- Direct mailing to various interested parties.

Public Notice Contents

- ◆ Permitting authority information
- ◆ Applicant information
- ◆ Brief description of facility
- ◆ Contact for additional information
- ◆ Comment procedure description
- ◆ Location and availability of administrative record
- ◆ Additional information

Submitting Comments

- ◆ Must be in writing
- ◆ Request additional information
- ◆ Modifications to draft permit
- ◆ Why draft permit is inadequate
- ◆ All reasonable arguments
- ◆ Factual material
- ◆ Suggest alternatives
- ◆ Request public hearing

- All comments must be receiving in writing.
- Frequently, comments are simply requests for additional information.
- Some comments suggest modifications to the draft permit.
- Other comments may indicate that the draft permit is inadequate for various reasons.
- All parties providing comments must submit all reasonable arguments indicating why the permit should be modified from its draft form or why a permit condition is inadequate.
- All parties providing comments must submit factual material in support of their positions.
- Commenters should list alternatives, if applicable.
- An interested party may request a public hearing.

Public Hearing

- ◆ Requested in writing
- ◆ Any interested party
- ◆ Optional
- ◆ Public notice 30-days in advance
- ◆ May extend comment period
- ◆ Transcript available

- A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing.

- A request for a hearing does not automatically necessitate that a hearing be held. A public hearing should be held when there is a significant amount of interest expressed during the 30-day comment period or when it is necessary to clarify the issues involved in the permit decision. Thus, the decision of whether or not to hold a public hearing is actually a judgement call. Such decisions are usually made by someone other than the permit writer. However, the permit writer will be responsible for ensuring that all of the factual information in support of the draft permit is well documented.

- Public notice of a public hearing must be given at least 30 days prior to the public meeting, but may be included in the public notice of the draft permit. Scheduling a hearing automatically extends the comment period until the close of the hearing.

- Anyone may submit written or oral comments concerning the draft permit at the hearing. A transcript or recording of the hearing must be available to interested persons.

Workshops

- ◆ Optional
- ◆ 2-way dialogue
- ◆ Provide information
- ◆ Informal - no transcript

Workshops for the public are used to provide more information when the permit writer feels that it would be beneficial. The workshop allows the public to ask questions and EPA to provide answers or vice versa. Workshops are informal in that it is not recorded in any manner.

Documentation for Permit Issuance

- ◆ Documentation for draft permit
- ◆ All comments
- ◆ Tape or transcript of public hearing
- ◆ Responses to comments
- ◆ draft or final EIS (for New Sources only)
- ◆ Final permit

Administrative Actions

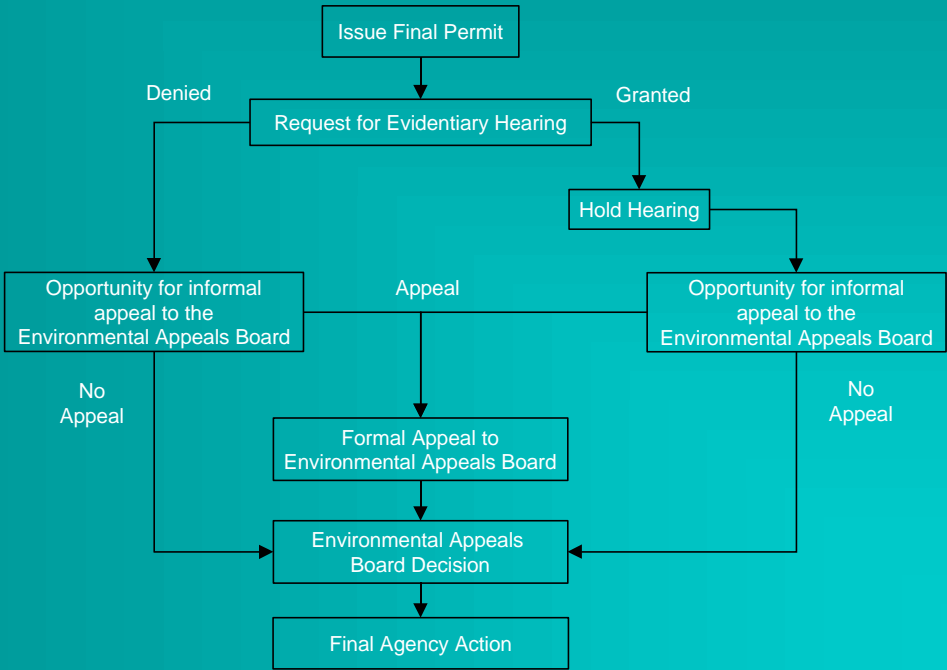
- ◆ Appeal
- ◆ Modification
- ◆ Termination and Revocation
- ◆ Transfer

Permit Appeals

- ◆ Permittee or third party
- ◆ Within 30-days of final issuance
- ◆ Evidentiary hearing
- ◆ Grant/deny by regional administrator
- ◆ Must be public noticed
- ◆ Only contested conditions stayed

- The permittee or an interested party may choose to legally contest or appeal the NPDES permit. Challenges are limited to issues raised during the public comment on the draft permit unless good cause is shown (e.g., new condition imposed as a result of public comments).
- The appeal must be requested within 30-days following final permit issuance.
- The administrative procedure involved is called an evidentiary hearing and is presided over by an administrative law judge.
- All requests for evidentiary hearings are coordinated through the office of the EPA Regional Counsel. The regional administrator decides to grant or deny the hearing request.
- The hearing must be public noticed.
- Only those conditions contested in the permit are stayed.

Permit Appeal Process



Permit Modifications

- ◆ Modification
- ◆ Triggers
 - inspection
 - request by permittee
 - request by any interested person
- ◆ Types
 - major: require public notice
 - minor: no public notice

- In a permit modification, only the conditions subject to change are reconsidered while all other permit conditions remain in effect.
- A permit modification may be triggered in several ways; in response to a regulatory inspection, from information submitted by the permittee, or by any interested party.
- There are two types of permit modifications: major and minor. From a procedural standpoint, they differ primarily with respect to the public notice requirement. Major modifications require public notice; minor modifications do not.

Major Permit Modifications

- ◆ Reopener
- ◆ Technical mistakes
- ◆ Failure to notify
- ◆ Alterations
- ◆ New information
- ◆ New regulations
- ◆ Compliance schedules

Virtually all modifications that result in less stringent conditions must be treated as major modifications, with provisions for public notice and comment. The following conditions (40 CFR 122.62) would necessitate a major modification:

- Conditions in the permit that required it to be reopened under certain circumstances.
- To correct technical mistakes or mistaken interpretations of law made in developing the permit conditions.
- Upon failure of an approved State to notify another State whose waters may be affected by a discharge from the approved State.
- When alterations or changes in operations occur that justify new conditions that are different from the existing permit.
- When information is received that was not available at the time of permit issuance
- When standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision.
- To modify the compliance schedule in light of the additional time that may be required to construct an Innovative or Alternative facility; or when good cause for modification of a compliance schedule exists, such as an Act of God, strike, or flood.

Major Permit Modifications (cont.)

- ◆ Pretreatment
- ◆ Failed BPJ compliance
- ◆ Non-limited pollutants
- ◆ Variance requests
- ◆ Adjust net limits
- ◆ Insert sludge requirements
- ◆ Notification levels

- To require that an approved program be implemented or to change the schedule for program development.
- When BPJ technology is installed and properly operated and maintained but the permittee is unable to meet its limits, the limits may be reduced to reflect actual removal; but in no case may they be less than the guideline limits. If BPJ operation and maintenance costs are totally disproportionate to the costs considered in a subsequent guideline, the permittee may be allowed to backslide to the guideline limits.
- When the level of discharge of any pollutant that is not limited in the permit exceeds the level that can be achieved by the technology-based treatment requirements appropriate to the permit.
- When requests for variances, net effluent limitations, pretreatment, etc., are filed within the specified time but not granted until after permit issuance.
- Upon request of a permittee who qualifies for effluent limitations on a net basis under 40 CFR 122.45(g) and (h).
- To insert CWA 307(a) toxic or 40 CFR 503 sludge use/disposal requirements.
- To establish notification levels for toxic pollutants that are not limited in the permit but must be reported if concentrations in the discharge exceed these levels.

Minor Permit Modifications

- ◆ Typographical errors
- ◆ Increase monitoring frequency
- ◆ Interim compliance dates (<180 days)
- ◆ Change ownership
- ◆ Change construction schedule (new source)
- ◆ Delete outfall
- ◆ Incorporate pretreatment program

- Typographical errors must be corrected.
- More frequent monitoring or reporting is necessary.
- An interim compliance date in the schedule of compliance needs revision, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with the final compliance date requirement.
- Ownership has changed but no other change is necessary.
- The construction schedule for a new source discharger needs revision.
- A point source outfall that does not result in the discharge of pollutants from other outfalls must be deleted from the permit.
- An approved local pretreatment program must be incorporated into the permit.

Permit Termination & Revocation

- ◆ Retract privilege to discharge
- ◆ Public notice
- ◆ Causes
 - noncompliance
 - misrepresentation or omission of facts
 - activity endangers environment
 - reduction or elimination of discharge

Situations may arise during the life of the permit that are cause for termination (I.e., cancellation, revocation). The entire permit may be reconsidered when a permit is revoked and reissued. Once a permit has been terminated, it can only be replaced in effect by initiation of the issuance process (submittal of permit application, etc.).

Circumstances for termination (40 CFR 122.62(b)) include:

- Noncompliance by the permittee with any condition of the permit.
- Misrepresentation or omission of relevant facts by the permittee
- A determination that the permitted activity endangers human health or the environment, either in an emergency or other situation.
- A temporary or permanent reduction or elimination of a discharge (e.g., plant closure).

Permit Transfer

- ◆ Modification
- ◆ Revocation
- ◆ Automatic
 - 30-days notice
 - written agreement
 - no permit modification or revocation

Permit transfers are when there is a change in the owner and/or operator of the facility. A permit may be transferred using the following provisions:

- The transfer may be made during the process of modification, either major or minor.
- The transfer may be addressed by revoking and subsequently reissuing the permit.
- The transfer may be automatic if three conditions are met:
 - The current permittee notified the Director 30 days in advance of the transfer date.
 - The notice includes a written agreement between the old and new owner on the terms of the transfer
 - The Director of the regulatory agency does not indicate that the subject permit will be modified or revoked.

Objectives of Workshop



- ✓ Overview of statutes & regulations
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Compliance & Enforcement

- ◆ Compliance
- ◆ Enforcement
- ◆ Public participation
- ◆ Policies

Achieving and maintaining a high level of compliance with environmental laws and regulations are two of the most important goals of Federal and State environmental agencies.

Compliance

- ◆ Compliance Monitoring
 - compliance review
 - compliance inspections
- ◆ Quarterly Noncompliance Reports (QNCR)

• Compliance monitoring is a generic term that includes all activities undertaken by Federal or State regulatory agencies to ascertain a permittee's adherence to a NPDES permit. A primary function of the compliance monitoring program is the verification of compliance with permit conditions. Compliance monitoring is comprised of two elements:

- Compliance review - The review of all written reports and other material relating to the status of a permittee's compliance
- Compliance inspections - Field-related regulatory activities, including sampling, conducted to determine compliance.

Compliance Monitoring Process

- ◆ Receive data
- ◆ Review data
- ◆ Enter data into PCS
- ◆ Identify violators
- ◆ Determine appropriate response

Compliance Review

- ◆ Permit files
- ◆ Compliance files
- ◆ Permit Compliance System (PCS)

- These files contain the administrative record.
- These files contain the final permit, compliance schedule reports, compliance inspection reports, DMRs, enforcement actions, and correspondence (telephone records, letters, etc.).
- PCS is a data management system used to compile all relevant facts about a facility's permit conditions, self-monitoring data, the inspections performed, and any enforcement actions taken. PCS is the national database for the NPDES program and promotes national consistency and uniformity in permit and compliance evaluations.

Compliance Inspections

- ◆ Regulatory presence
- ◆ Permit requirements met
- ◆ Permittee's performance
- ◆ Corrective actions
- ◆ Independent data
- ◆ Proper O&M
- ◆ Required construction

Compliance inspections refer to all field-related regulatory activities conducted to determine permit compliance. Compliance inspections are undertaken for one or more of the following purposes

- To establish a regulatory presence to defer violations
- To ensure that permit requirements are being met or to determine if permit conditions are adequate
- To check the completeness and accuracy of a permittee's performance and compliance records
- To assess the adequacy of the permittee's self-monitoring and reporting program
- To determine the progress or completion of corrective action
- To obtain independent compliance data on a facility's discharge
- To evaluate the permittee's operation and maintenance activities
- to observe the status of construction required by the permit.

Compliance Inspection Types

- ◆ Evaluation inspection (non-sampling)
- ◆ Sampling inspections
- ◆ Other specialized inspections
 - diagnostic inspections
 - performance audit inspections
 - biomonitoring inspections
- ◆ Remote sensing

Compliance field activities may include:

- Evaluation inspections (non-sampling)
- Sampling inspections
- Specialized inspections
 - Diagnostic inspections
 - Performance audit inspections
 - Biomonitoring inspections - specifically targeted at facilities with effluent suspected or identified as causing toxicity problems that threaten the ecological balance of the receiving waters.
- Remote sensing

Quarterly Noncompliance Reports (QNCR)

- ◆ Majors
- ◆ Reportable noncompliance (RNC)
- ◆ Significant noncompliance (SNC)
- ◆ Exceptions list

EPA Regional Offices are required by regulation to report quarterly on major facilities that are not in compliance with the terms and conditions of their permit (i.e., effluent limitations meet the criteria for reportable noncompliance (RNC), schedules, and reporting requirements).

Only major facilities that meet RNC criteria must be reported on the QNCR.

A subset of instances of RNC that appear on the QNCR may be noted as significant noncompliance (SNC). The distinction between RNC and SNC is that SNC is a priority with EPA.

If the facility is still considered SNC after two quarters and no formal enforcement action has been taken, the facility is placed on the Exceptions List. Although there are some legitimate justifications for facilities appearing on the Exception List, the Exceptions List generally indicates facilities for which the administering agency (EPA) failed to handle enforcement in a timely and appropriate manner.

Reportable Noncompliance (RNC)

- ◆ Permit limit violations
- ◆ Interim limits
- ◆ Schedule
- ◆ Reporting
- ◆ Single event

- Data that exceeds or equals the limit times the Technical Review Criteria (TRC) for 2 months during a 6-month period, where the TRC is 1.4 for Group I pollutants and 1.2 for Group II pollutants (Appendix A to 40 CFR 123) OR data that exceeds the limit for 4 months during a 6-month period
- Any violation of any magnitude for interim effluent limits set forth in a formal enforcement action.
- Missing a compliance schedule milestone date by 90 days.
- Missing a report due date by 30 days.
- A violation of any magnitude considered to have an adverse effect on water quality or public health (e.g., unauthorized bypass, unpermitted discharge, frequent discharges of a variety of pollutants).

Significant Noncompliance (SNC)

- ◆ Management accountability
- ◆ Track compliance trends
- ◆ Evaluate enforcement timeliness
- ◆ Initiatives - Not regulatory

SNC indicates that a violation is of sufficient magnitude and/or duration to be considered among the Agency's priorities for regulatory review and/or response.

- Used solely for management accountability purposes
- Is a means of tracking trends in compliance
- Used to evaluate relative timeliness of appropriate enforcement response toward priority violations
- SNC is not regulatory and may be changed as the NPDES Program changes to encompass new initiatives.

SNC Categories

- ◆ Violation of enforcement actions
- ◆ Violation of permit limits
- ◆ Violation of compliance schedule
- ◆ Violation of reporting requirements
- ◆ Unauthorized discharge or bypass
- ◆ Water quality or health impacts

Categories of SNC are:

- Violation of enforcement action requirements (i.e., administrative effluent limits, key compliance schedule milestones, and key reports)
- Violation of permit limits
- Violation of key compliance schedule milestones contained in a permit
- Violation of key reporting requirements in a permit
- Any unauthorized discharge or bypass considered significant by the NPDES Program director
- Violations associated with water quality or health impacts.

Enforcement

- ◆ EPA enforcement goals
- ◆ Types of enforcement actions
- ◆ Enforcement response considerations

Specific enforcement actions are focused on a small subset of the total number of violators - violators at site where frequent or serious violations have occurred.

EPA Enforcement Goals

- ◆ Timely correction of violations
- ◆ Deter future violations
- ◆ Equal treatment
- ◆ Punish serious violators
- ◆ Effectively manage enforcement resources
 - staff time
 - funds

EPA tries to achieve several goals when choosing the appropriate enforcement response:

- correction of the violation as soon as possible
- Deterrence of future violations by the same permittee or other permittees
- Equal treatment of the regulated community through use of a uniform approach to selecting enforcement responses (i.e., similar violations are treated similarly)
- Punishment of serious violations
- Effective use of enforcement resources by achieving protection of human health and the environment with the least amount of staff time and funds

Types of Enforcement Actions

- ◆ Debriefing deficiencies
- ◆ Telephone call
- ◆ Letter of violation
- ◆ Notice of violation
- ◆ Administrative order
- ◆ Administrative fine
- ◆ Civil lawsuit
- ◆ Criminal prosecution

Typical types of enforcement actions include:

- Inspection debriefing - calling attention to deficiencies
- etc.

Enforcement Response Considerations

- ◆ Magnitude, frequency & duration
- ◆ Severity
- ◆ Degree of economic benefit
- ◆ Previous enforcement action(s)
- ◆ Deterrent effect
- ◆ Fairness & equity
- ◆ National consistency
- ◆ Program integrity

Considerations when making determinations on the level of the enforcement response include:

- an assessment of the magnitude, frequency and duration of the violations
- the severity of the permit violation
- the degree of economic benefit obtained through the violation
- previous enforcement actions taken against the violator
- the deterrent effect of the response on similarly situated permittees
- fairness to the permittee and equity amongst similar violators
- national consistency in how similar violations are handled
- the integrity of the NPDES program

Public Participation

- ◆ Freedom of Information Act (FOIA)
- ◆ Federal civil action
- ◆ Proposed consent decree
- ◆ Civil judicial enforcement action
 - against permittee
 - against EPA/State
 - not if EPA prosecuting
 - 60-days notice

Citizens can participate in the enforcement process in a number of ways.

- Under the FOIA, citizens have the right to request certain facility-specific compliance information from EPA's PCS database
- Interested citizens can intervene in any Federal civil action to enjoin any threatened or continuing violation of any program requirement or permit conditions, and to recover civil penalties in court.
- Citizens also have the opportunity to review and comment on any proposed consent decree to resolve a Federal civil judicial enforcement action.
- Section 505 of the CWA allows any citizen to commence a civil judicial enforcement action on his/her own behalf
 - against any person (including the U.S. or any government agency) who is alleged to be in violation of an effluent standard or limitation or an enforcement order issued by EPA or
 - against EPA where the regulatory authority is alleged to have failed to take appropriate action.
 - Citizens may not commence suit if EPA is diligently prosecuting a civil or criminal actions
 - Citizens must give EPA and the alleged violator 60-days notice or the alleged violation prior to commencing a citizen suit.

Policies

- ◆ Self-audit policy (Dec. 22, 1995)
- ◆ Small business policy (Jun. 10, 1996)
- ◆ Small community policy (Nov. 22, 1995)

As part of President Clinton's 1995 regulatory reform initiative, EPA's Office of Enforcement and Compliance Assurance (OECA) issued three policies to provide incentives for voluntary compliance.

- Incentives for Self-Policing: Disclosure, Correction and Prevention of Violations - compliance relief for permittees who find violations through environmental audits or efforts that reflect due diligence and promptly disclose and correct those violations. Also gives partial compliance relief to permittees who voluntarily discovered and disclosed violations not found through audits or with due diligence.
- Policy on Compliance Incentives for Small Businesses - special incentives to conduct environmental audits and promptly correct violations. Entire civil penalty eliminated if small business satisfies all four of following:
 - the business has made a good faith effort to comply as demonstrated by either receiving on-site governmental compliance assistance or conducting a voluntary environmental audit and promptly disclosing in writing all violations discovered as part of the audit
 - in past three years, the business was not subject to an action for the current violation and in the past five years the small business has not been subject to two or more enforcement actions for environmental violations
 - the business corrects the violation and remedies any harm associated with the violation within 6 months of discovery
 - the violation has not caused or does not pose actual serious harm and has not involved criminal conduct.
- Policy on Flexible State Enforcement Responses to Small Community Violations - Allows small communities to participate in environmental compliance. To choose communities to participate, the following process should be followed: assess community's good faith and environmental compliance status, determine community's administrative technical and financial capacity to comply, weigh the comparative risks associated with competing environmental mandates, and enter into enforceable agreement

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Any Questions?